A330
TECHNICAL TRAINING MANUAL
MECHANICAL & AVIONICS COURSE - T1+T2 (LVL 2&3)
(RR Trent 700)
ICE AND RAIN PROTECTION

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ICE AND RAIN PROTECTION

Ice & Rain Protection Line MAINT Briefing (RR700) (2) 2

WING ICE PROTECTION

Wing Ice Protection D/O (3) 38

ENGINE AIR INTAKE ICE PROTECTION

Engine Air Intake Ice Protection D/O (3) 52

PROBE ICE PROTECTION

Probe Ice Protection D/O (3) 66

WINDSHIELD PROTECTION

Windshield A.ICE/Defogging & Rain PROT D/O (3) 74

POTABLE AND WASTE WATER ICE PROTECTION

Potable & Waste Water Ice Protection D/O (3) 84

ESCAPE SLIDE LOCKING MECHANISM ICE PROTECTION

Escape Slide Locking Mechanism Ice Protection D/O (3) 88

ICE DETECTION

Ice Detection D/O (3) 98

MAINTENANCE PRACTICE

Ice & Rain Protection System Base Maintenance (3) 104

G9409341 - GAUT0T0

ICE & RAIN PROTECTION LINE MAINT BRIEFING (RR700) (2)

SYSTEM OVERVIEW

GENERAL

The Ice and Rain Protection System lets the aircraft operate without restriction in icing conditions or heavy rain. Hot air or electrical heating protects critical areas of the aircraft. The different sub systems of the Ice and Rain Protection System are:

- wing ice protection,
- engine air intake ice protection,
- probe ice protection,
- windshield anti-icing, defogging and rain protection,
- potable and waste water ice protection,
- escape slide locking mechanism ice protection,
- ice detection,
- maintenance/test facilities.

When you work on aircraft, you must obey all the safety procedures listed in the AMM.

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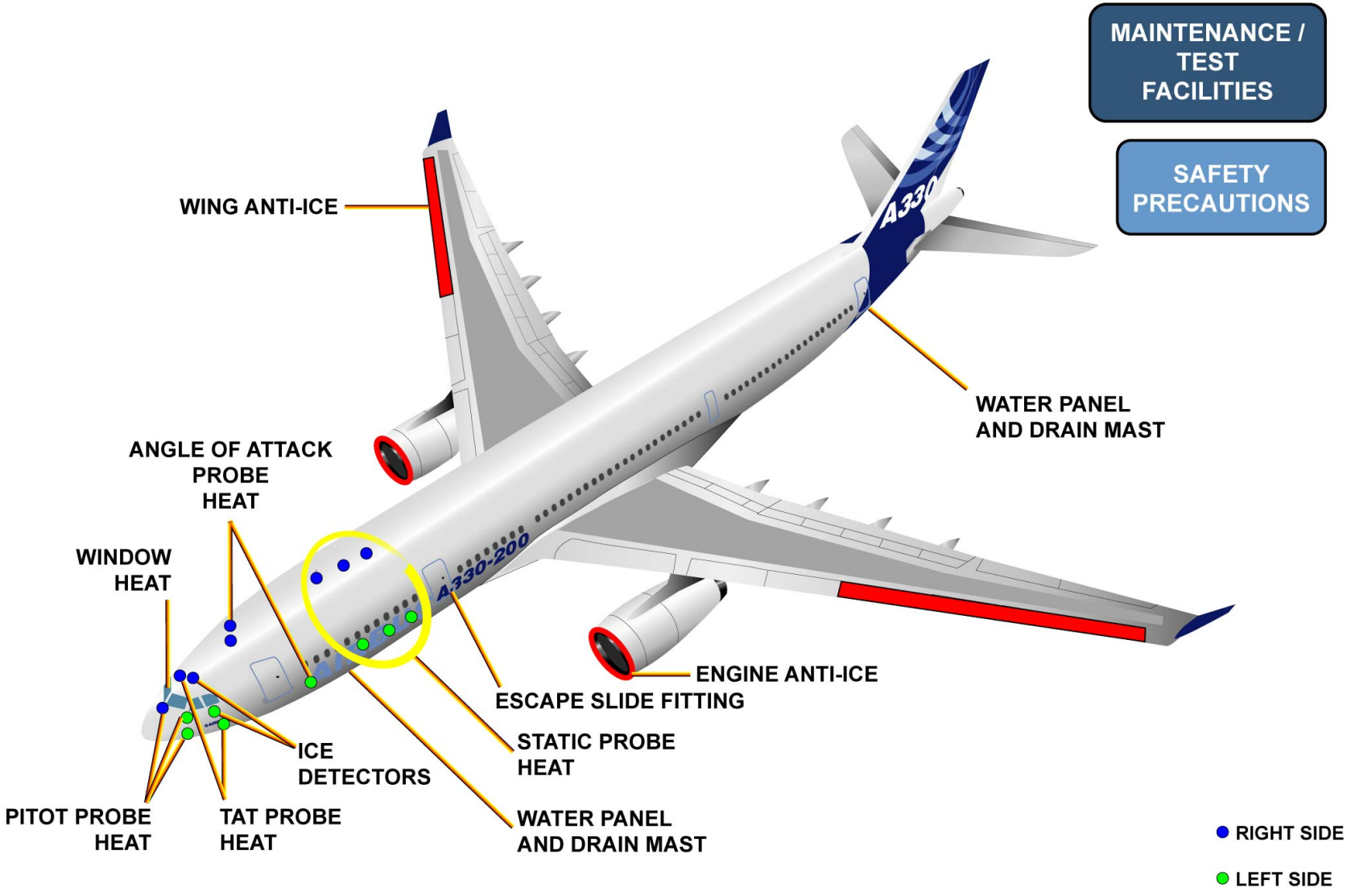

SYSTEM OVERVIEW - GENERAL

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ICE & RAIN PROTECTION LINE MAINT BRIEFING (RR700) (2)

SYSTEM OVERVIEW (continued)

WING ICE PROTECTION

During icing conditions, hot air is supplied by the pneumatic system to the four outboard slats to raise the temperature. Bleed air is supplied to each wing through two Wing Anti Ice (WAI) valves, one for the slat number four and one for slats number five, six and seven.
If a failure occurs in the wing ice protection system:
- the Zone Controller (ZC) sends the failure data to the Centralized Maintenance Computer (CMC),
- the System Data Acquisition Concentrator (SDAC) sends data to the ECAM.

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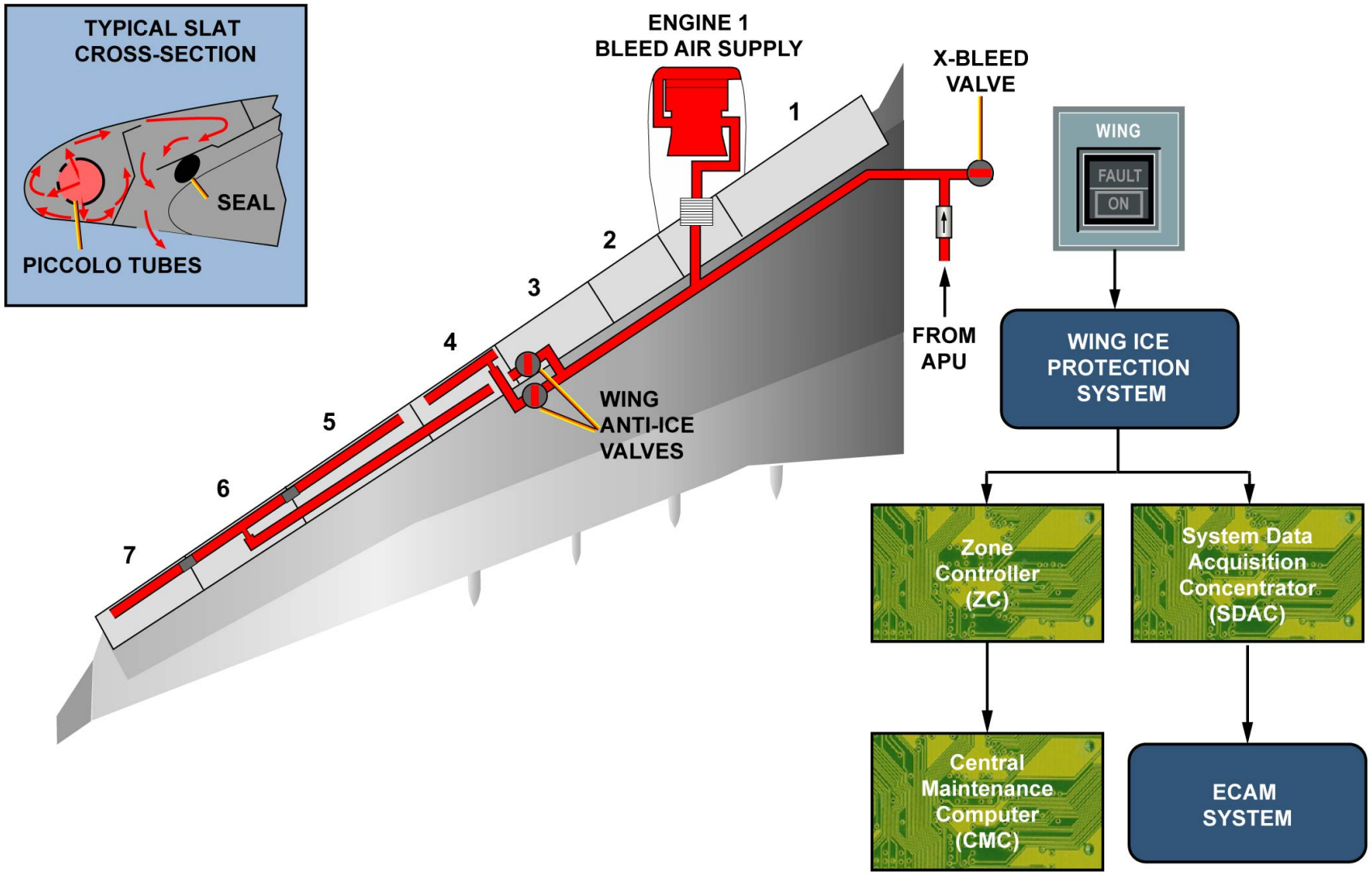

SYSTEM OVERVIEW - WING ICE PROTECTION

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ICE & RAIN PROTECTION LINE MAINT BRIEFING (RR700) (2)

SYSTEM OVERVIEW (continued)

ENGINE AIR INTAKE ICE PROTECTION

Engine air intake ice protection system ensures safe engine operation in icing or snowy conditions. Hot air bled from HP compressor is used to heat the engine air intake lip in order to prevent ice accretion. Hot air is supplied through an engine air intake anti-ice valve.

The engine air intake ice protection system interfaces with the SDAC for system status display on the ECAM and warning generation. The engine air intake ice protection system also interfaces with the ZC for air bleed demand computation to be sent to the Full Authority Digital Engine Control (FADEC) via the Engine Interface and Vibration Monitoring Unit (EIVMU).

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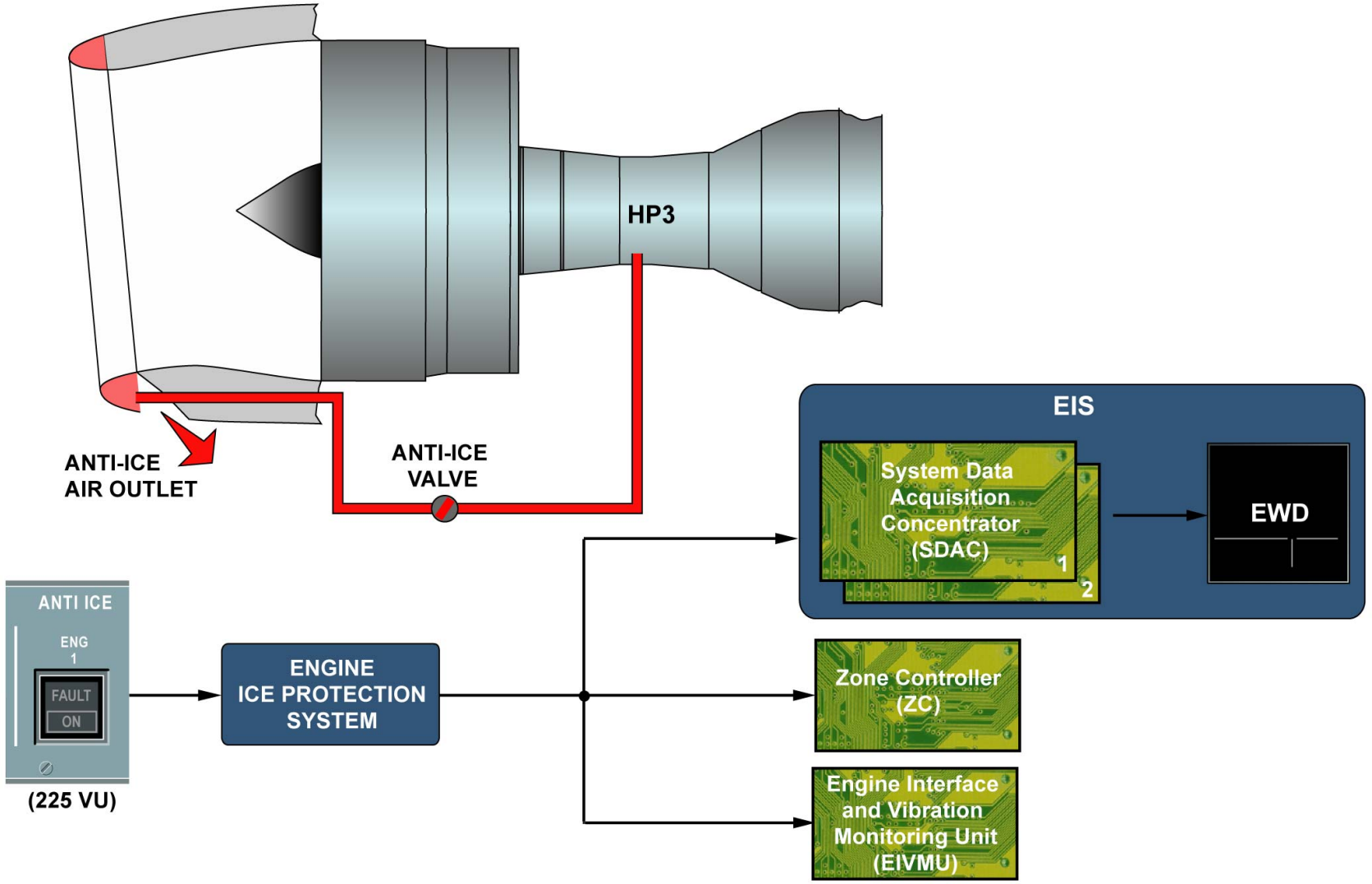

SYSTEM OVERVIEW - ENGINE AIR INTAKE ICE PROTECTION

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ICE & RAIN PROTECTION LINE MAINT BRIEFING (RR700) (2)

SYSTEM OVERVIEW (continued)

PROBE ICE DETECTION

The static probes, Angle Of Attack (AOA), pitot and Total Air Temperature (TAT) sensors are electrically heated to prevent ice formation. The Captain, the First Officer and standby probe heating systems are independent. Each one has one Probe Heat Computer (PHC), which controls probe and static port heating. The standby system has no TAT probe. The PROBE/WINDOW HEAT P/BSW overrides the automatic operation. On ground, pitot heating is reduced and TAT heating is cut off.

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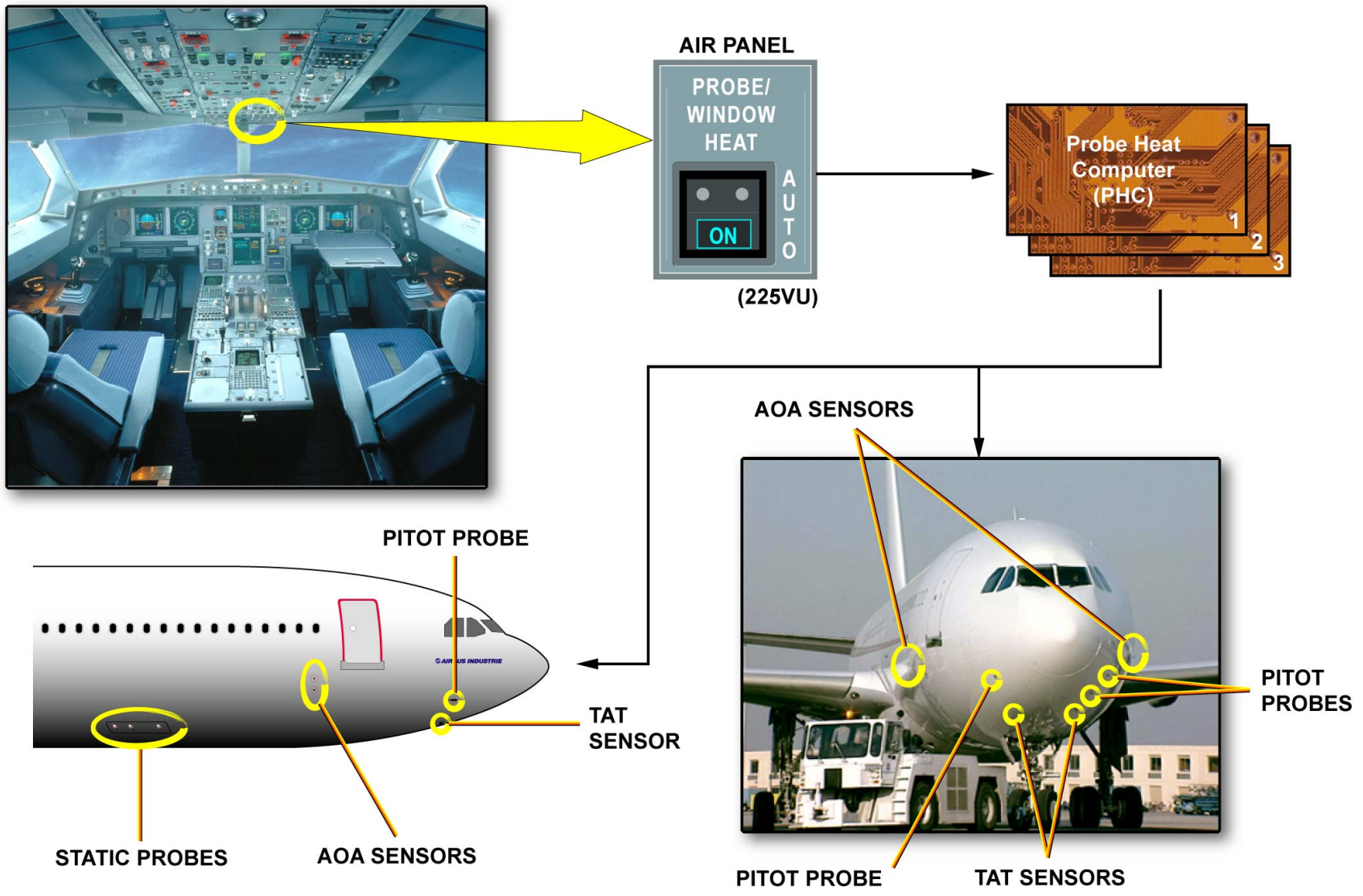

SYSTEM OVERVIEW - PROBE ICE DETECTION

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ICE & RAIN PROTECTION LINE MAINT BRIEFING (RR700) (2)

SYSTEM OVERVIEW (continued)

WINDSHIELD ANTI-ICING

Windshields and side windows are electrically heated to maintain clear visibility in icing or misting conditions. Windshields are de-iced and side windows are dimisted. The windshield heating operates at low power on ground and at full power in flight. The PROBE/WINDOW HEAT P/BSW overrides the automatic operation. Two fully independent Window Heat Computers (WHCs), one on each side, carry out the heat system monitoring and the overheat protection of their respective windshield and windows.

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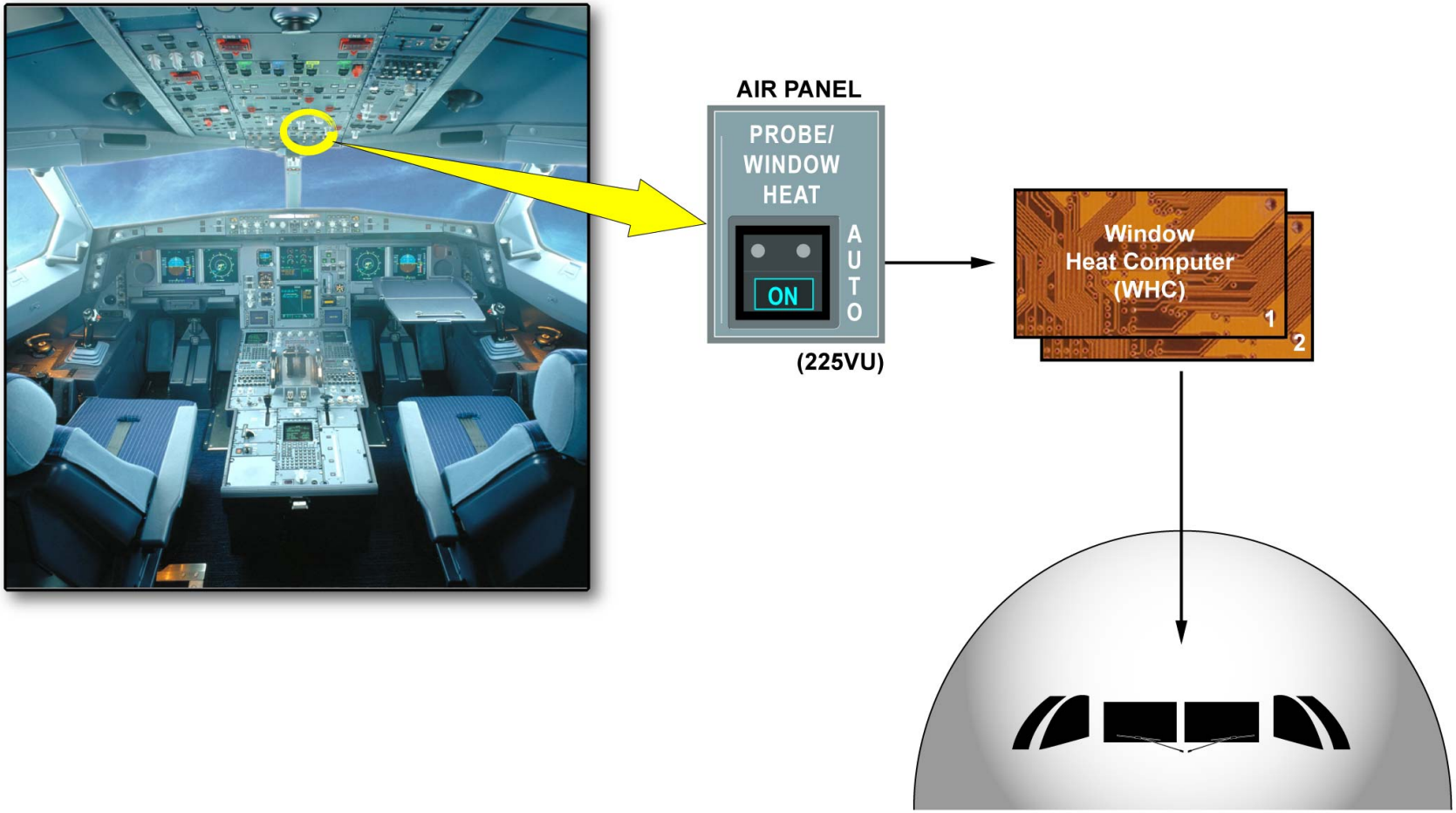

SYSTEM OVERVIEW - WINDSHIELD ANTI-ICING

ICE & RAIN PROTECTION LINE MAINT BRIEFING (RR700) (2)

SYSTEM OVERVIEW (continued)

RAIN PROTECTION

Rain removal from the windshield is done by two independent wipers and in heavy rain, by a rain repellent system. These systems are controlled from the overhead panel. The rain repellent fluid (FORALKYL 2211) is discharged onto the left or right windshield from a pressurized canister installed at the rear of the cockpit. The rain repellent system is inhibited on the ground when the engines are not running.

NOTE: Leakage of FORALKYL 2211 fluid can be detected due to its pine odor.

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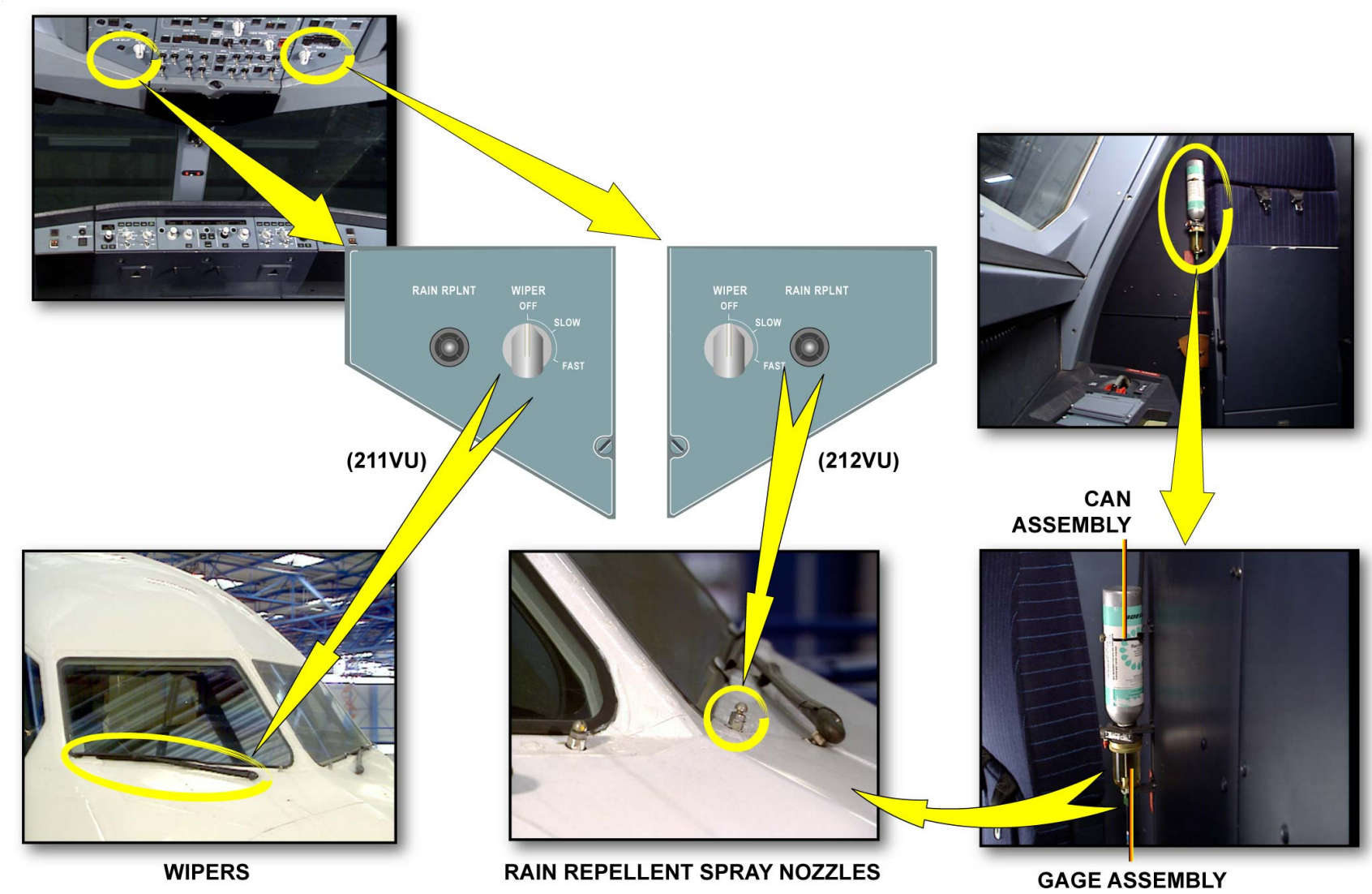

SYSTEM OVERVIEW - RAIN PROTECTION

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ICE & RAIN PROTECTION LINE MAINT BRIEFING (RR700) (2)

SYSTEM OVERVIEW (continued)

POTABLE AND WASTE WATER ICE PROTECTION

An automatic water ice protection system is installed to prevent ice formation in flight or on ground at freezing temperature on the following lines:
- the potable water,
- the waste water,
- the water servicing panels,
- the drain masts.

Heating of these water lines is controlled and monitored by two Ice Protection Control Units (IPCUs) based upon information received from temperature sensors installed on these lines. One IPCU controls the lines of the aircraft forward section, the second one the lines of the aft section.

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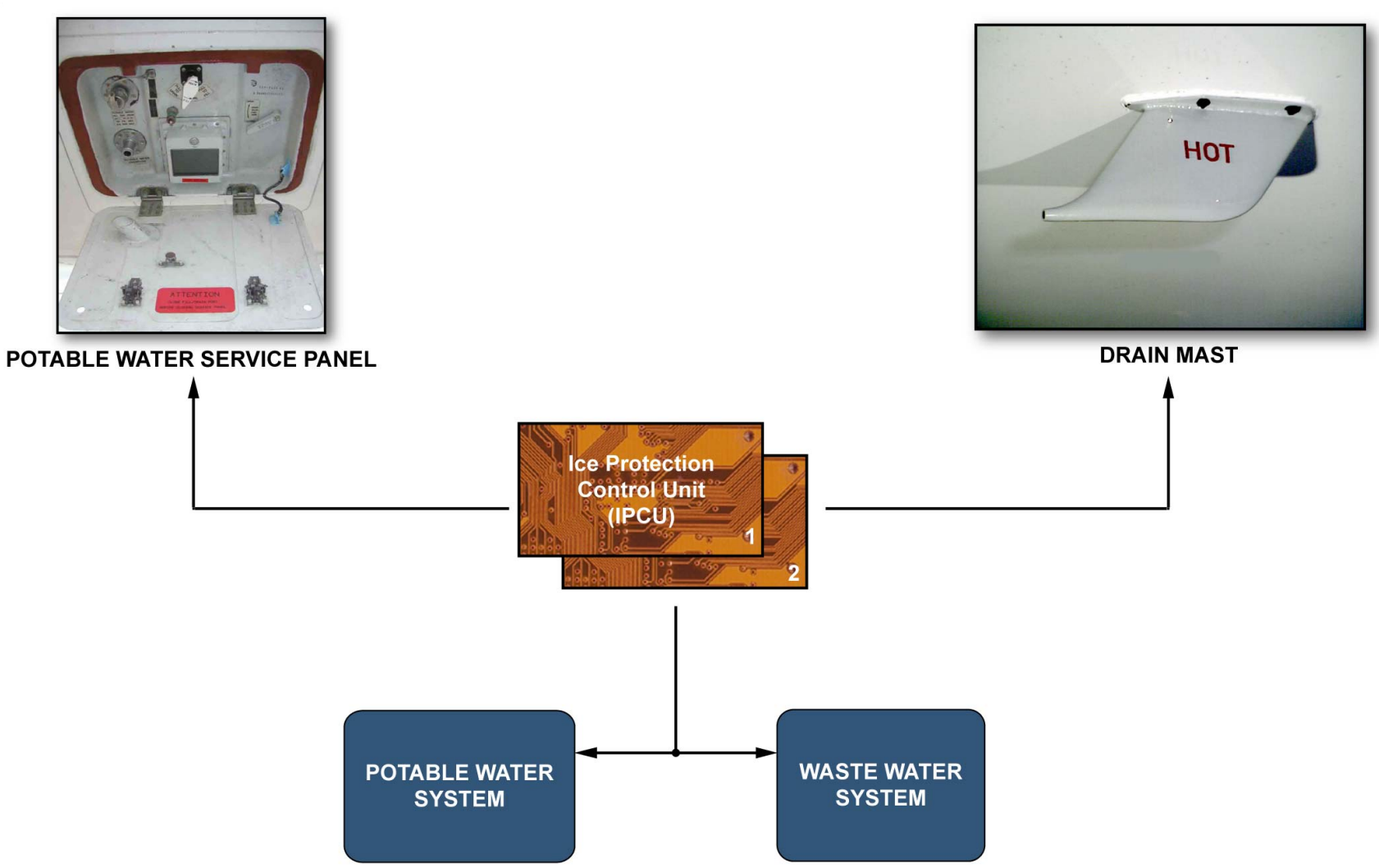

SYSTEM OVERVIEW - POTABLE AND WASTE WATER ICE PROTECTION

ICE & RAIN PROTECTION LINE MAINT BRIEFING (RR700) (2)

SYSTEM OVERVIEW (continued)

ESCAPE SLIDE LOCKING MECHANISM ICE PROTECTION

An electrical ice protection system prevents ice accretion on the Slide Attachment Fittings (SAFs) during flight that could lead to escape slide disarming difficulties on ground at door opening. Each passenger/crew door has two heated SAFs. On the A340-600, the overwing-emergency exits have no heated SAFs. The heating elements located in the related locking plate are powered automatically when icing conditions are detected, if the escape slide is armed. The system is controlled and monitored by two IPCUs, one for doors 1 and 2 (LH and RH) and one for doors 3 and 4 (LH and RH).

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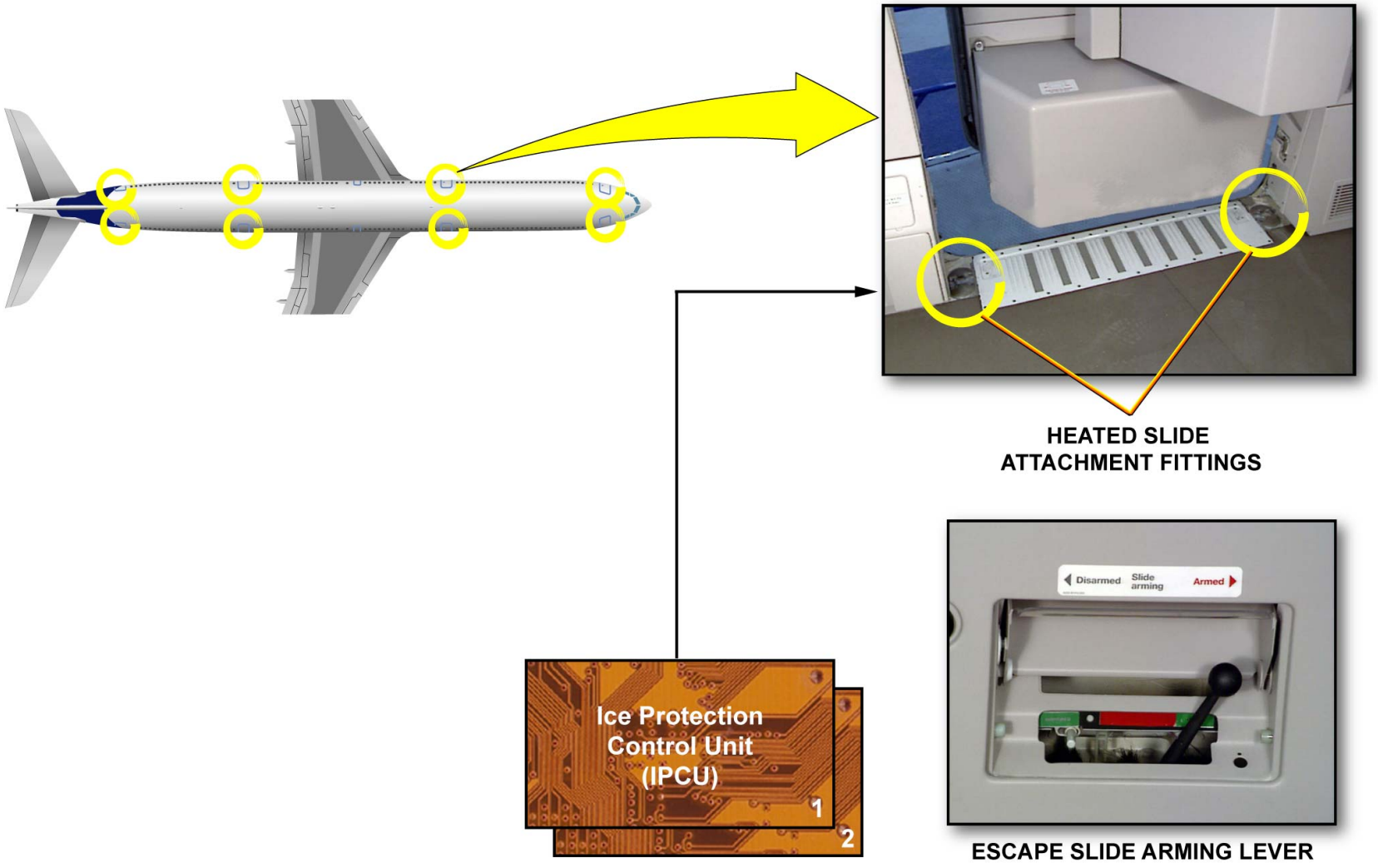

SYSTEM OVERVIEW - ESCAPE SLIDE LOCKING MECHANISM ICE PROTECTION

ICE & RAIN PROTECTION LINE MAINT BRIEFING (RR700) (2)

SYSTEM OVERVIEW (continued)

ICE DETECTION

An external visual ice indicator with an integrated light is installed between both windshields to be visible from the CAPT and F/O sides. This indicator light comes on from the ICE INDicator & STandBY COMPASS selector switch on the INTerior LighT panel. In icing conditions, the ice accretion on the indicator prevents the integrated light to be visible from the cockpit.

In addition, a dual advisory ice detection system is installed to give:

- a better detection of icing conditions,
- fuel saving by cutting off the anti-icing systems when the latter is no longer necessary.

The dual advisory ice detection system is made of two ice detectors installed on the skin of the aircraft and directly connected to the FWC to send warning messages to the crew on the EWD. Two levels of detections are given:

- ICE DETECTED used for the selection of engine anti-ice,
- SEVERE ICE DETECTED used for the selection of wing anti-ice.

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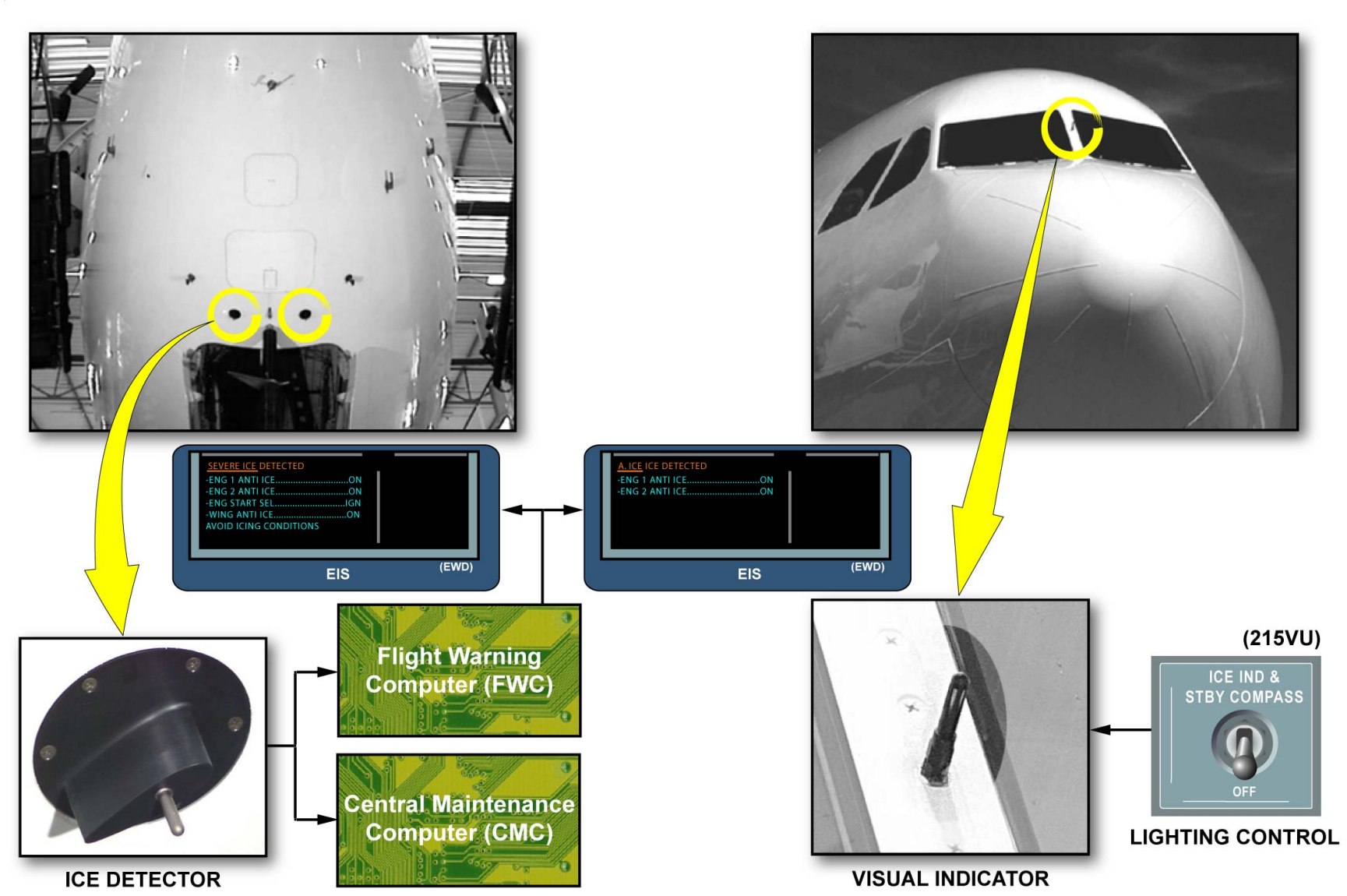

SYSTEM OVERVIEW - ICE DETECTION

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ICE & RAIN PROTECTION LINE MAINT BRIEFING (RR700) (2)

SERVICING

CHECK OF RAIN-REPELLENT FLUID CAN ASSEMBLY FOR CORRECT FLUID LEVEL AND PRESSURE

This task is accomplished to check that the rain-repellent fluid level and pressure are set correctly. For the pressure gage:
- make sure that the pointer points to the green area,
- if the pointer points to the yellow area, replace the rain-repellent fluid can.

For the fluid level:
- make sure that there is sufficient rain-repellent fluid in the gage assembly,
- if you see the surface of the fluid, replace the rain-repellent fluid can,

If the level and/or pressure is/are not correct, change the rain-repellent fluid can.

NOTE: In case of leakage of the rain repellent fluid, you can smell a pine odor.

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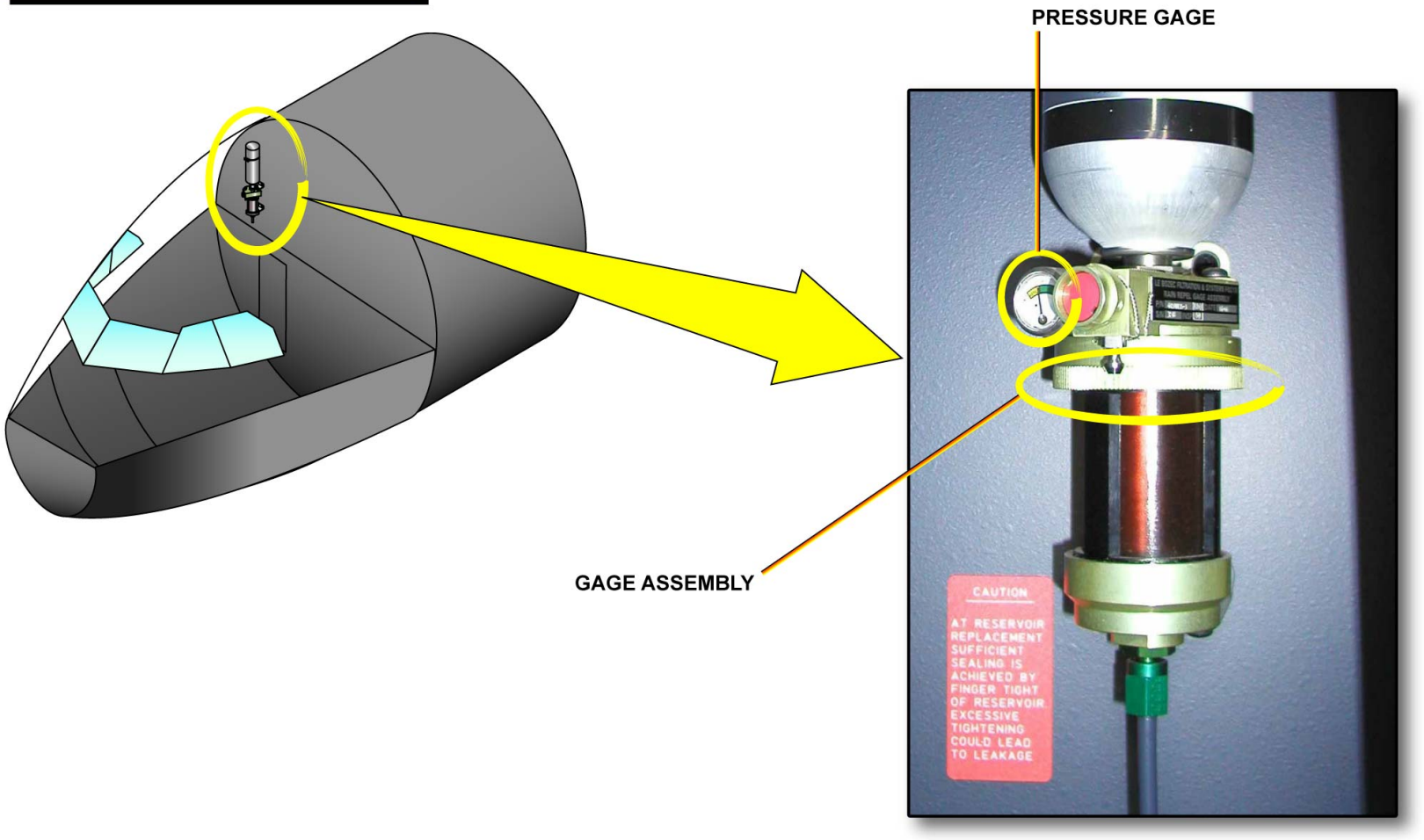
✓ CHECK OF RAIN-REPELLENT FLUID CAN ASSEMBLY FOR CORRECT FLUID LEVEL AND PRESSURE.


PRESSURE GAGE
GAGE ASSEMBLY
CAUTION
AT RESERVOIR REPLACEMENT SUFFICIENT SEALING IS ACHIEVED BY FINGER TIGHT OF RESERVOIR. EXCESSIVE TIGHTENING COULD LEAD TO LEAKAGE

SERVICING - CHECK OF RAIN-REPELLENT FLUID CAN ASSEMBLY FOR CORRECT FLUID LEVEL AND PRESSURE

G9409341 - GAUT0T0 - FM30B1000000003

ICE & RAIN PROTECTION LINE MAINT BRIEFING (RR700) (2)

SERVICING (continued)

FLUID CAN REPLACEMENT PROCEDURE

WARNING: DO NOT GET THE FLUID ON YOUR SKIN OR IN YOUR EYES. IF YOU DO:
- FLUSH IT AWAY WITH CLEAN WATER,
- GET MEDICAL AID.

Cleaning instructions: Make sure that the fluid does not stay on the aircraft furnishing. If the fluid gets on the aircraft furnishings, clean with appropriate cleaning agents. Put a warning notice in the cockpit to tell people not to operate the RAIN RePeLeNT P/BSWs.

WARNING: MAKE SURE THAT YOU DEPRESSURIZE THE RAIN REPELLENT SYSTEM BEFORE YOU REMOVE THE RAIN REPELLENT FLUID CAN. RAIN REPELLENT FLUID CAN COME OUT SUDDENLY IF YOU REMOVE THE FLUID CAN WITH THE SYSTEM PRESSURIZED.

Connect a hose to the drain valve of the rain repellent fluid gage and put the hose outlet in a container. Push the P/B to depressurize the system.
- remove the clamp,
- loosen and remove the fluid can,
- remove and discard the seal,
- put a blanking plug on the disconnected line ends,
- after cleaning the components interfaces, remove the blanking plug and install a new seal,
- put the new rain repellent fluid can and tighten it manually,
- install the clamp on the can and tighten it,
- push the P/B,
- make sure that the fluid level is correct and increases to the correct pressure,
- make sure that there is no leak.
- disconnect the hose from the drain valve and remove the container from the A/C,
- make sure that the work area is clean and clear of tools and items,
- close the access door and remove the warning notice from the cockpit.

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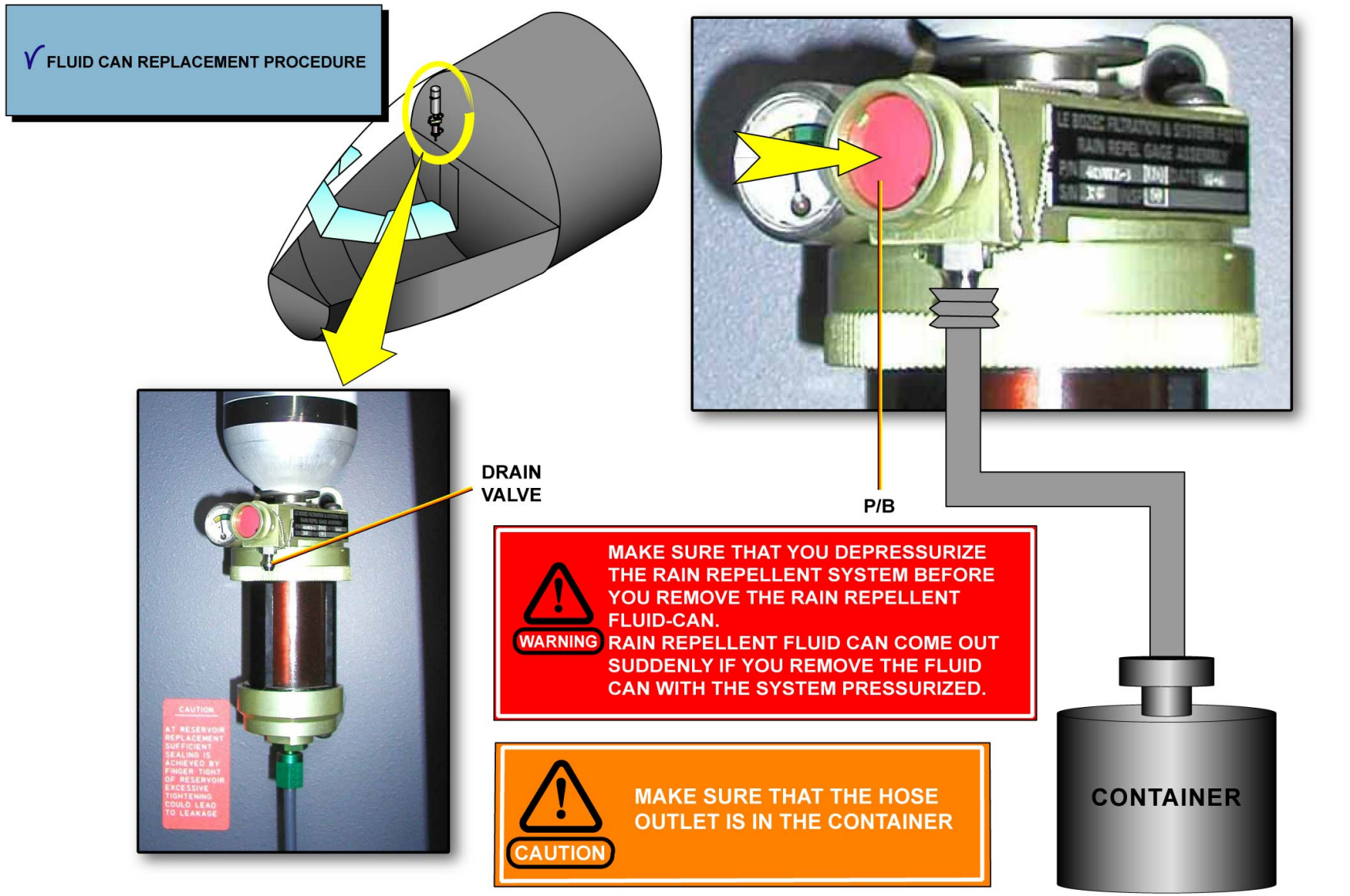
✓ FLUID CAN REPLACEMENT PROCEDURE

WARNING
DO NOT GET THE FLUID ON YOUR SKIN OR IN YOUR EYES. IF YOU DO:
- FLUSH IT AWAY WITH CLEAN WATER
- GET MEDICAL AID

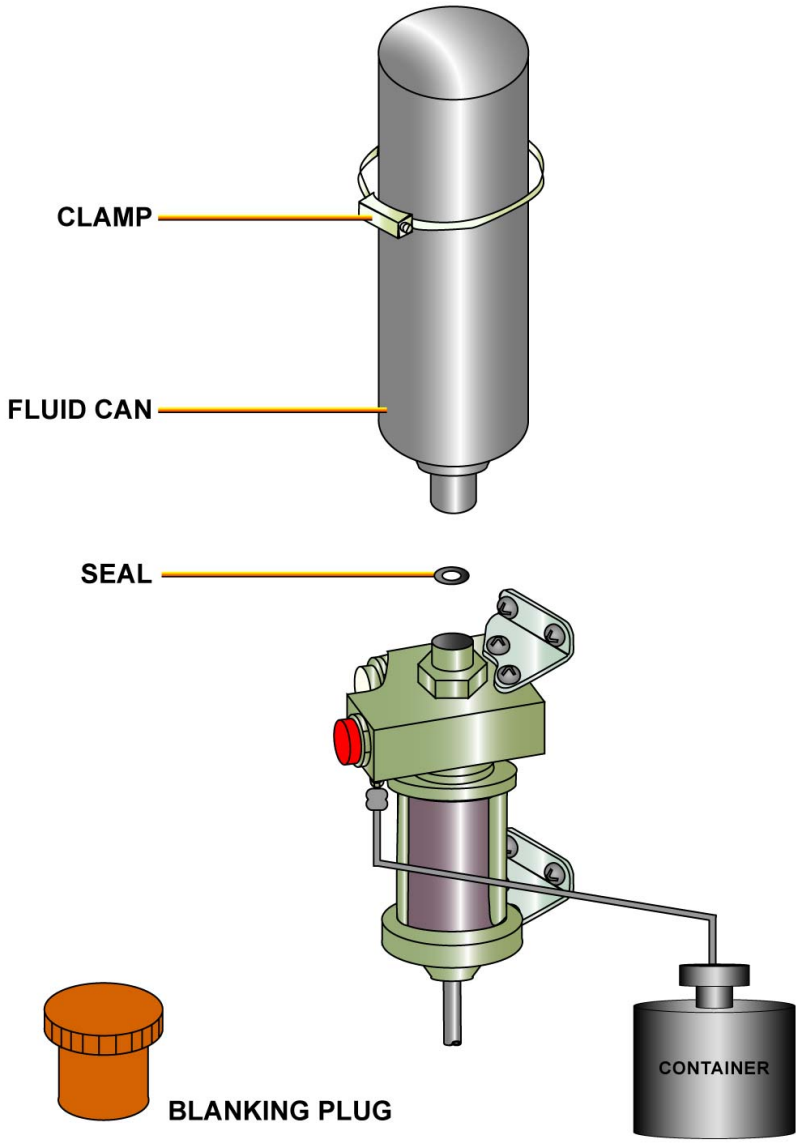
CLEANING INSTRUCTIONS: Make sure that the fluid does not stay on aircraft furnishing. If the fluid gets on the aircraft furnishings, clean with appropriate cleaning agent.

SERVICING - FLUID CAN REPLACEMENT PROCEDURE


FLUID CAN REPLACEMENT PROCEDURE
DRAIN VALVE
P/B
WARNING
MAKE SURE THAT YOU DEPRESSURIZE THE RAIN REPELLENT SYSTEM BEFORE YOU REMOVE THE RAIN REPELLENT FLUID-CAN.
RAIN REPELLENT FLUID CAN COME OUT SUDDENLY IF YOU REMOVE THE FLUID CAN WITH THE SYSTEM PRESSURIZED.
CAUTION
MAKE SURE THAT THE HOSE OUTLET IS IN THE CONTAINER
CONTAINER

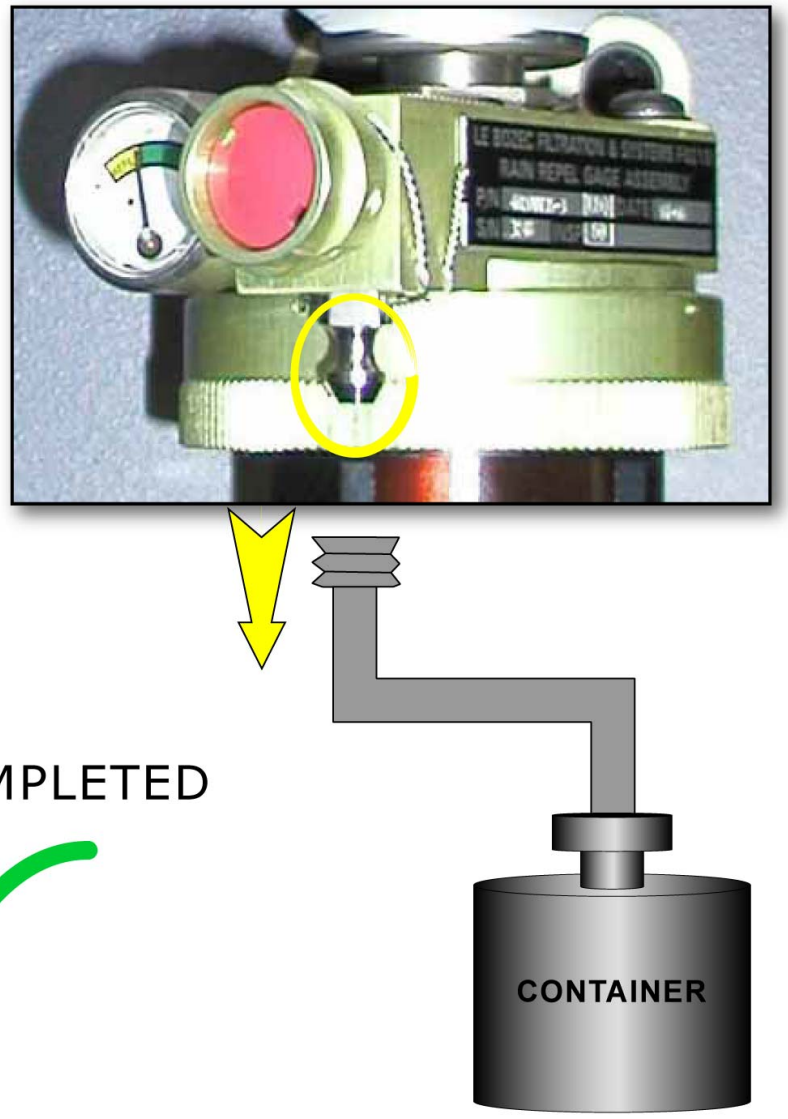
SERVICING - FLUID CAN REPLACEMENT PROCEDURE

✓ FLUID CAN REPLACEMENT PROCEDURE



SERVICING - FLUID CAN REPLACEMENT PROCEDURE

✓ FLUID CAN REPLACEMENT PROCEDURE



SERVICING - FLUID CAN REPLACEMENT PROCEDURE

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ICE & RAIN PROTECTION LINE MAINT BRIEFING (RR700) (2)

MEL/DEACTIVATION

DEACTIVATION OF THE WING ANTI-ICE CONTROL VALVE IN THE CLOSED LOCKED POSITION

The A/C Minimum Equipment List (MEL) allows dispatch with one or both Wing Anti-Ice (WAI) valves in the locked closed position if the A/C is not operated in icing conditions. This deactivation procedure is as follows:
- check that the pneumatic system is not pressurized, the engines and the APU are shut down,
- use the slat/flap control lever-locking tool to lock the slat/flap control lever in position,
- open, safety and tag the related Circuit Breakers (C/Bs).

Put "warning notices" in these positions before you do work on the ice protection system:
- on the ground-power connections for high-pressure air, to tell persons not to pressurize the pneumatic system,
- on panel 125VU, on the centre pedestal, to tell persons not to operate the engines,
- on panel 215VU, on the overhead panel, to tell persons not to operate the APU,
- on panel 225VU, on the overhead panel, to tell persons not to pressurize the bleed air system,
- on panel 114VU, on the center pedestal, to tell persons not to operate the slats.

WARNING: DO NOT TOUCH THE ANTI-ICE DUCTS UNTIL THEY ARE COOL. THE DUCTS STAY HOT FOR SOME TIME AFTER THE ENGINE STOPS AND CAN BURN YOU. WEAR GOOGLES WHEN YOU REMOVE OR INSTALL LOCKWIRE. CUT, REMOVE AND DISCARD THE LOCKWIRE AS YOU DO THE TASK. LOOSE LOCKWIRE CAN CUT OR BLIND YOU.

To gain access to the valves:
- remove the applicable access panel.

The wing anti-ice valves are identical but the locking procedure is different due to the valve installation position. A lock screw locks the wing valve below. A locking clip locks the wing valve above. For the wing anti-ice valve above, an inspection mirror is necessary.

To deactivate the wing anti-ice control valve below:
- remove and discard the lockwire from the locking screw,
- move the indicator to the closed position,
- remove the locking screw from the stowage position,
- install the locking screw through the locking hole in the indicator,
- lockwire the locking screw in position.

For the wing anti-ice valve above, the procedure is different:
- check that the indicator is in the closed position,
- if not, slowly move the shaft with your hand to the required position,
- move the locking clip across until you feel the lock engages,
- if possible, slightly adjust the position of the shaft to get a movement of the locking clip.

NOTE: The unlocked position of the locking clip is in the middle-free position. It can be moved in either direction to lock the valve.

- remove the locking tool slat/flap control lever,
- remove the safety clip(s) and the tag(s) and close the related C/Bs,
- check that tools used during this procedure are removed,
- install the applicable access panel,

NOTE: - make an entry in the A/C technical logbook after the WAI control valve has been deactivated in the closed locked position.

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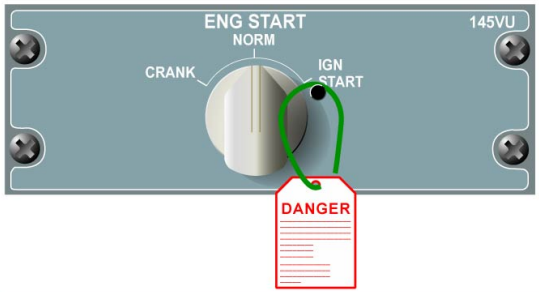
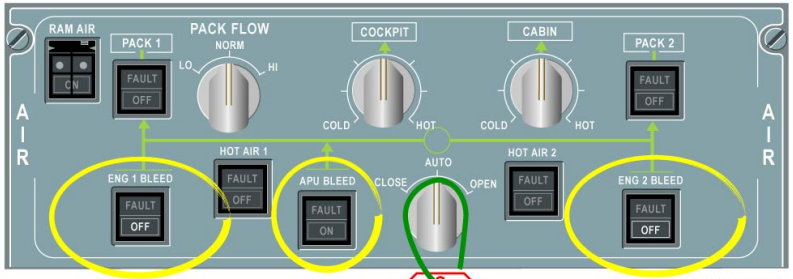
(125 VU)





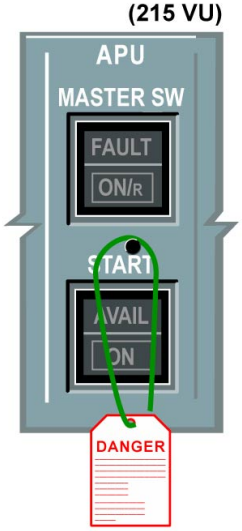
(225 VU)

WARNING MAKE SURE THAT THE PNEUMATIC SYSTEM IS DEPRESSURIZED BEFORE YOU START WORKING.
PRESSURIZED AIR CAN CAUSE INJURY TO PERSONS.

HP GROUND CONNECTORS

GROUND CART

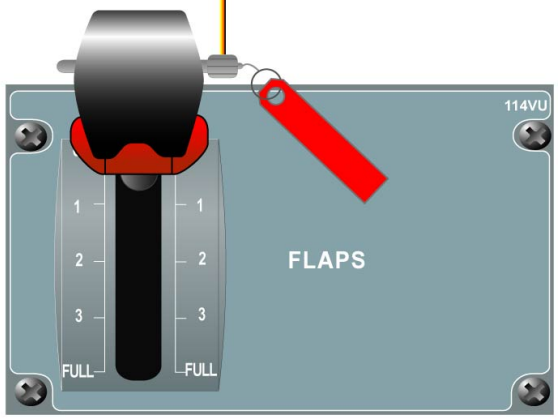
(215 VU)



SAFETY PRECAUTIONS

✓ OPEN SAFETY AND TAG THE RELATED C/Bs.

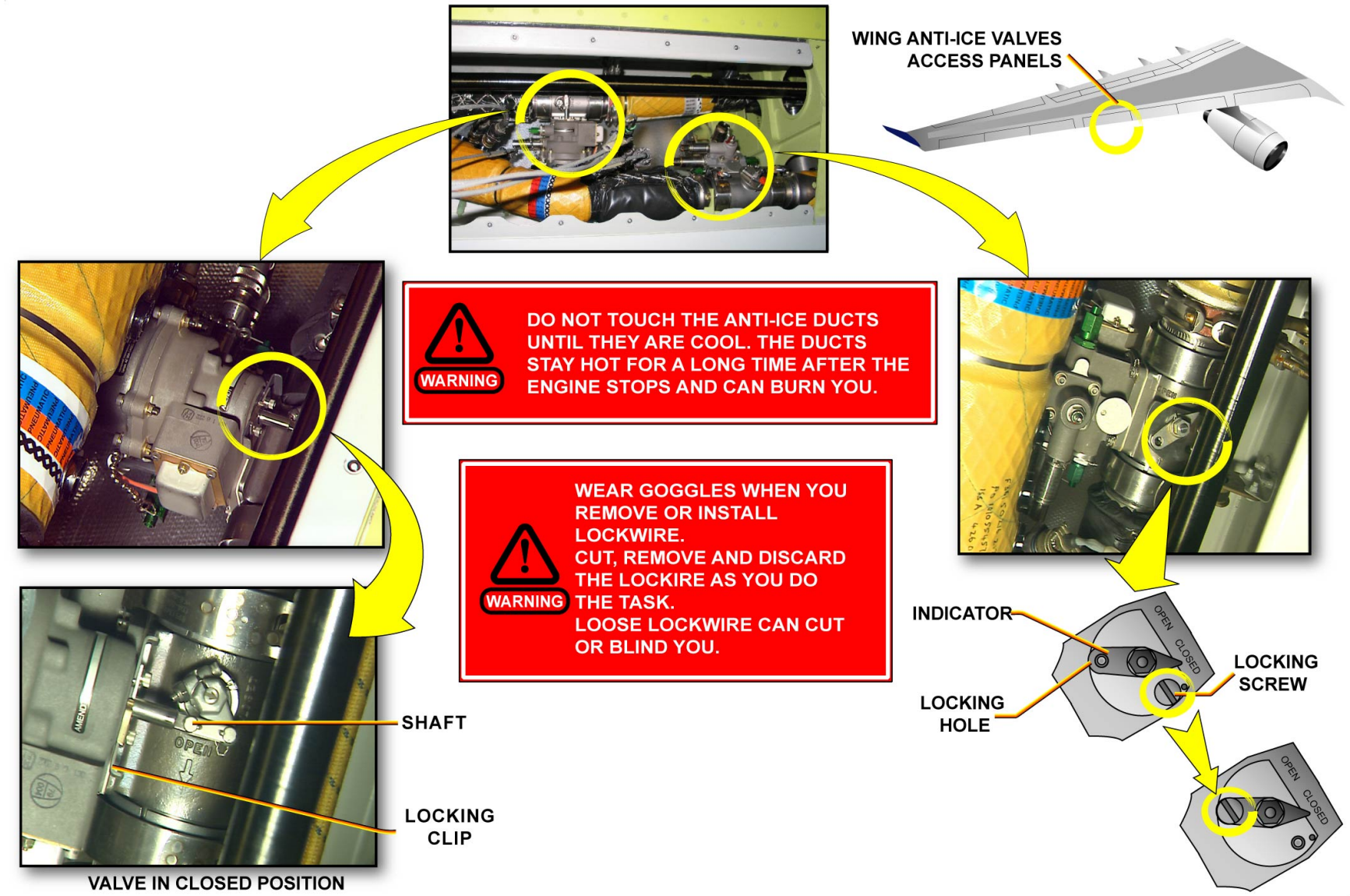
SLAT/FLAP CONTROL LEVER LOCKING TOOL



CONTROL LEVER PANEL (114 VU)

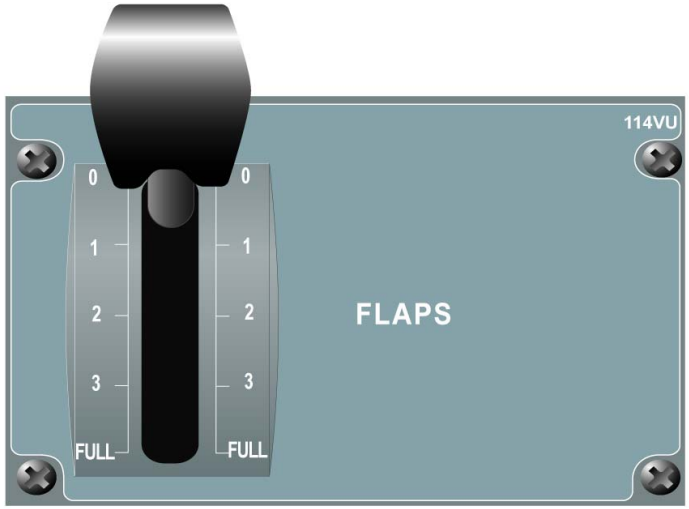
MEL/DEACTIVATION - DEACTIVATION OF THE WING ANTI-ICE CONTROL VALVE IN THE CLOSED LOCKED POSITION

G9409341 - GAUT0T0 - FM30B1000000003


WING ANTI-ICE VALVES
ACCESS PANELS
WARNING
DO NOT TOUCH THE ANTI-ICE DUCTS UNTIL THEY ARE COOL. THE DUCTS STAY HOT FOR A LONG TIME AFTER THE ENGINE STOPS AND CAN BURN YOU.
WARNING
WEAR GOGGLES WHEN YOU REMOVE OR INSTALL LOCKWIRE.
CUT, REMOVE AND DISCARD THE LOCKIRE AS YOU DO THE TASK.
LOOSE LOCKWIRE CAN CUT OR BLIND YOU.
INDICATOR
LOCKING SCREW
LOCKING HOLE
OPEN
CLOSED
SHAFT
LOCKING CLIP
VALVE IN CLOSED POSITION

MEL/DEACTIVATION - DEACTIVATION OF THE WING ANTI-ICE CONTROL VALVE IN THE CLOSED LOCKED POSITION

G9409341 - GAUT0T0 - FM30B1000000003



CONTROL LEVER PANEL (114 VU)

TASK COMPLETED

MEL/DEACTIVATION - DEACTIVATION OF THE WING ANTI-ICE CONTROL VALVE IN THE CLOSED LOCKED POSITION

ICE & RAIN PROTECTION LINE MAINT BRIEFING (RR700) (2)

MEL/DEACTIVATION (continued)

DEACTIVATION OF THE ENG AIR-INTAKE A-ICE CTRL VALVE IN THE CLOSED LOCKED POSITION

The A/C MEL is used to dispatch with one engine-air-intake anti-ice valve locked in the closed position if the A/C is not operated in icing conditions. It is also used for dispatch with one or more valves locked in the open position if flight performance penalties are applied. The deactivation procedure is as follows:

WARNING: BE CAREFUL WHEN YOU WORK ON THE ENGINE COMPONENTS IMMEDIATELY AFTER THE ENGINE IS SHUTDOWN. THE ENGINE COMPONENTS CAN STAY HOT FOR UP TO ONE HOUR. WAIT FIVE MINUTES AFTER ENGINES SHUTDOWN BEFORE DOING THIS PROCEDURE. YOU MUST NOT TOUCH HOT PARTS WITHOUT APPLICABLE GLOVES. HOT PARTS CAN CAUSE AN INJURY. IF YOU GET AN INJURY PUT IT IN COLD WATER FOR TEN MINUTES AND GET MEDICAL AID.

- Open, safety and tag the related circuit breakers.

Make sure that the engines shutdown occurred at least five minutes before you do this procedure:

- open the left fan cool door to gain access to the engine air-intake anti-ice valve,
- lock the anti-ice valve in the open or closed position,

NOTE: The arrow on the turret shows the relation of the butterfly valve to the valve body.

- remove the lockwire from the turret hole,
- remove the lock screw from the storage hole,
- use an applicable wrench on the turret and move the butterfly valve to the necessary position in the valve body (open or closed),
- hold the valve in the necessary position and install the lock screw through the boss cover and the turret,
- secure the turret with lockwire,
- make sure that the ANTI-ICE ENG 1(2) P/BSW is pushed (ON legend comes on),

NOTE: This test is required only in case the valve is deactivated in the OPEN position.

remove the safety clip(s) and the tag(s) and close the related C/Bs,

- check that tools used during this procedure are removed,
- close the left fan cowl door
- make an entry in the A/C technical logbook that the engine air-intake anti-ice valve has been deactivated locked in the closed position,
- put a warning notice in the cockpit to tell persons which anti-ice valve is locked in the closed position,
- de-energize the A/C electrical circuits

G9409341 - GAUT0T0 - FM30B1000000003

SAFETY PRECAUTIONS

✓ OPEN SAFETY AND TAG THE RELATED C/Bs.

WARNING

BE CAREFUL WHEN YOU WORK ON THE ENGINE COMPONENTS IMMEDIATELY AFTER THE ENGINE IS SHUTDOWN.
THE ENGINE COMPONENTS CAN STAY HOT FOR UP TO ONE HOUR.

WARNING

YOU MUST NOT TOUCH HOT PARTS WITHOUT APPLICABLE GLOVES.
HOT PARTS CAN CAUSE AN INJURY.
IF YOU GET AN INJURY PUT IN COLD WATER FOR TEN MINUTES AND GET MEDICAL AID.

WARNING

WAIT 5 MINUTES AFTER ENGINES SHUTDOWN BEFORE DOING THIS PROCEDURE.

MEL/DEACTIVATION - DEACTIVATION OF THE ENG AIR-INTAKE A-ICE CTRL VALVE IN THE CLOSED LOCKED POSITION

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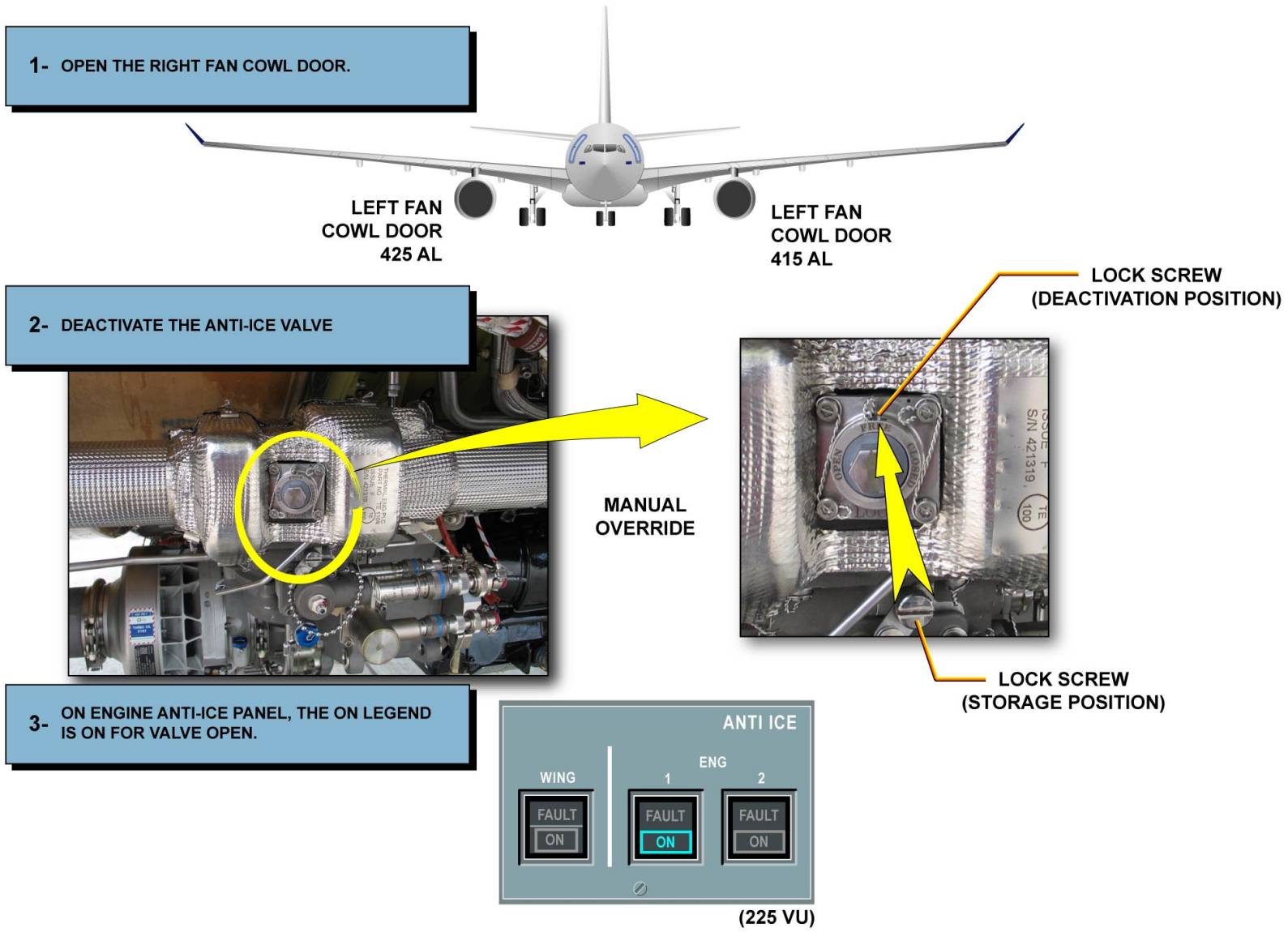

MEL/DEACTIVATION - DEACTIVATION OF THE ENG AIR-INTAKE A-ICE CTRL VALVE IN THE CLOSED LOCKED POSITION

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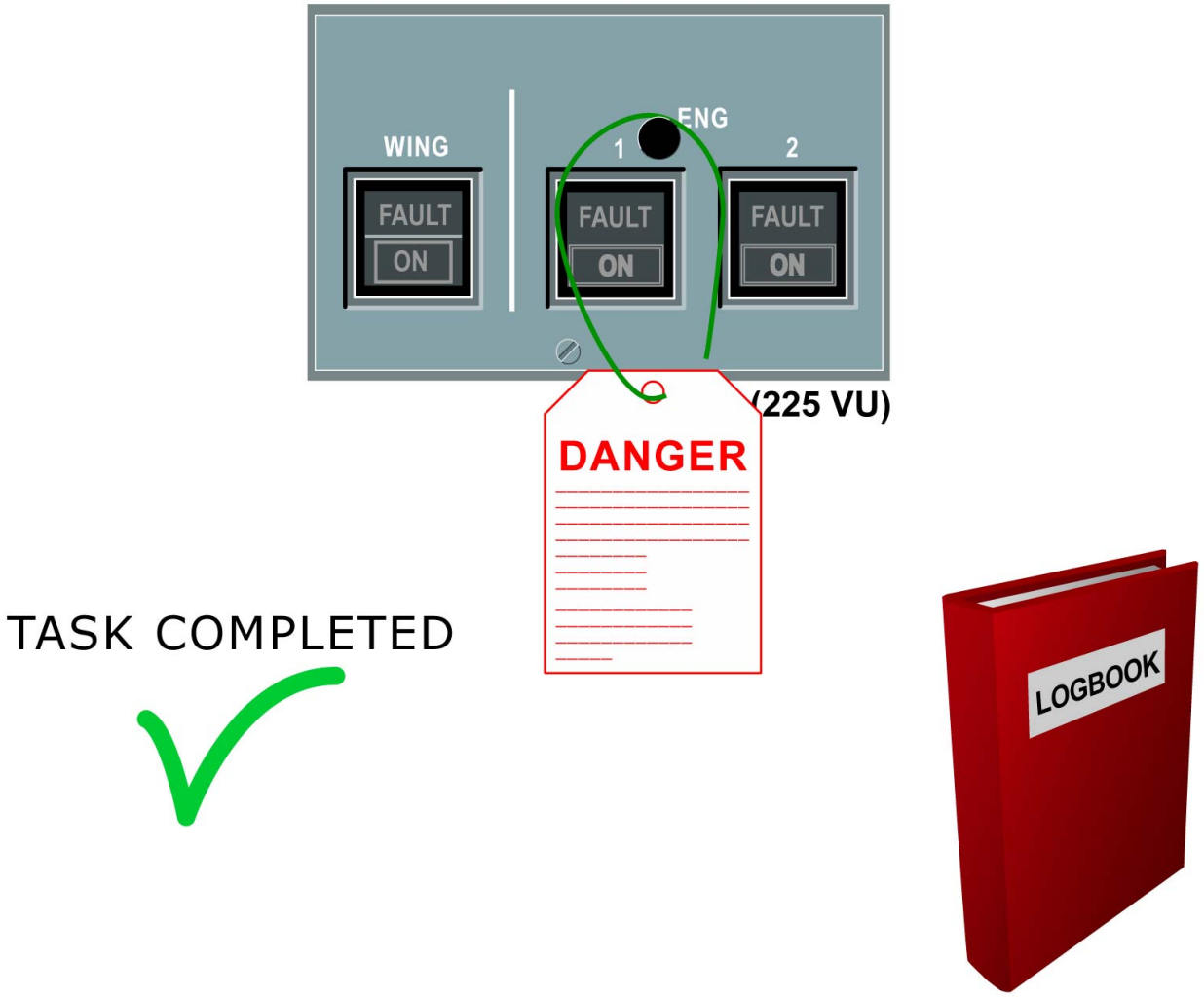

MEL/DEACTIVATION - DEACTIVATION OF THE ENG AIR-INTAKE A-ICE CTRL VALVE IN THE CLOSED LOCKED POSITION

ICE & RAIN PROTECTION LINE MAINT BRIEFING (RR700) (2)

MAINTENANCE TIPS-PROBE HEAT SYSTEM

When the aircraft is parked, it is recommended to install protective covers on the air data probes (static ports, pitot probes, AOA sensors and TAT sensors). The protective covers help to protect the probes from contamination. The covers should be marked with REMOVE BEFORE FLIGHT. Ground personnel must make sure that the covers are removed before flight or before the power is applied to the probes (engine start or ground test). The probe heat system operates automatically to power the air data probe heaters when at least one inboard engine is running. It is also designed to operate automatically when the aircraft is in flight. During troubleshooting and ground operations, do not pull the PHC or EIVMU or Landing Gear Control and Interface Unit (LGCIU) power supply C/Bs before pulling the entire probe heat C/Bs are pulled (Static supply (28VDC), AOA supply, pitot supply and TAT supply (all 115VAC)) otherwise the related probes and static ports will be heated.

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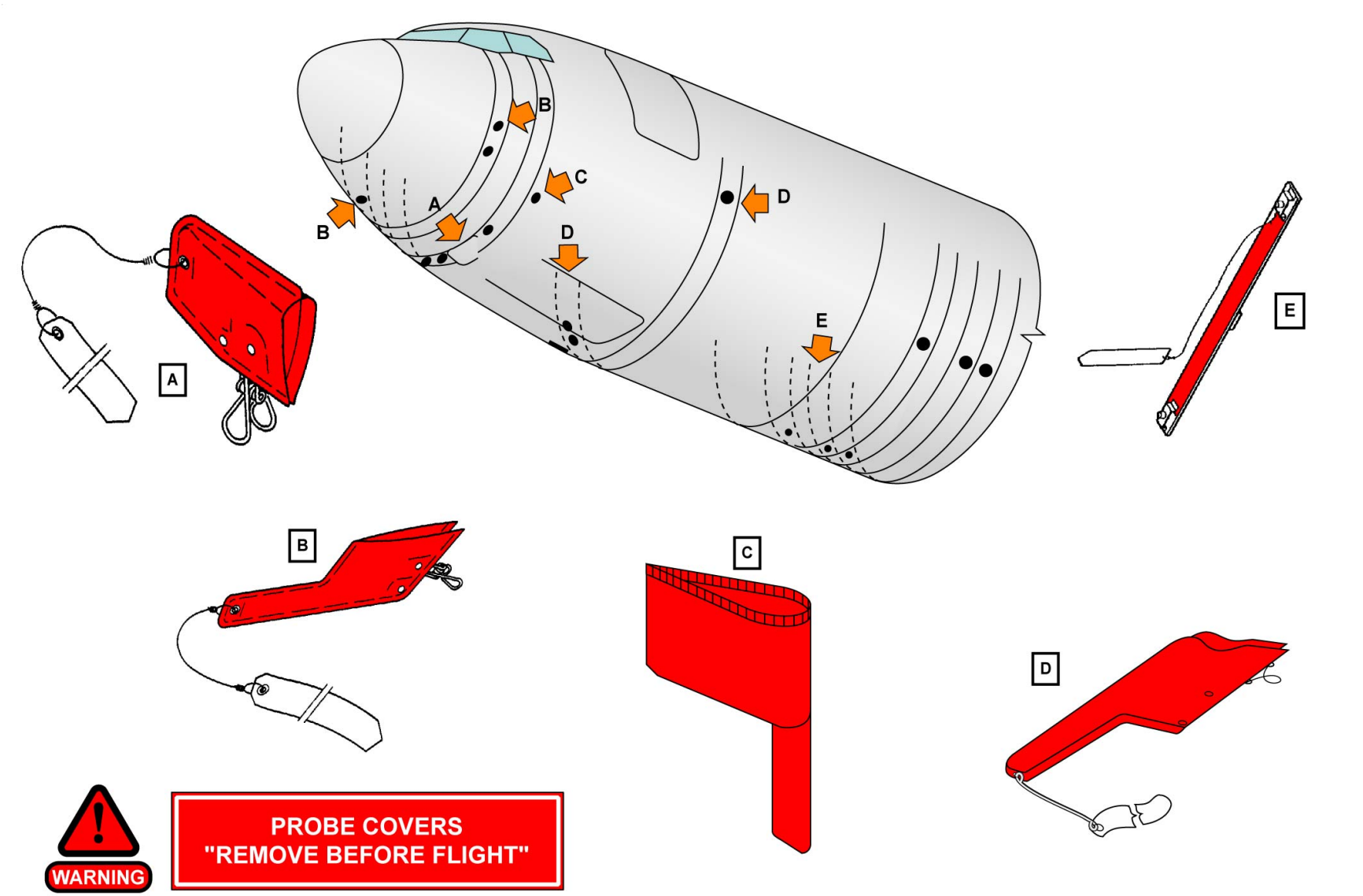

MAINTENANCE TIPS-PROBE HEAT SYSTEM

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WING ICE PROTECTION D/O (3)

GENERAL

The wing ice protection system prevents the formation of ice on the leading edge of slats No. 4, 5, 6 and 7. The system uses bleed air from the engines to heat the slats. The system is divided into two subsystems, one for each wing. Each subsystem is divided into two parts:
- one for the slat 4,
- one for the slats 5, 6 and 7.

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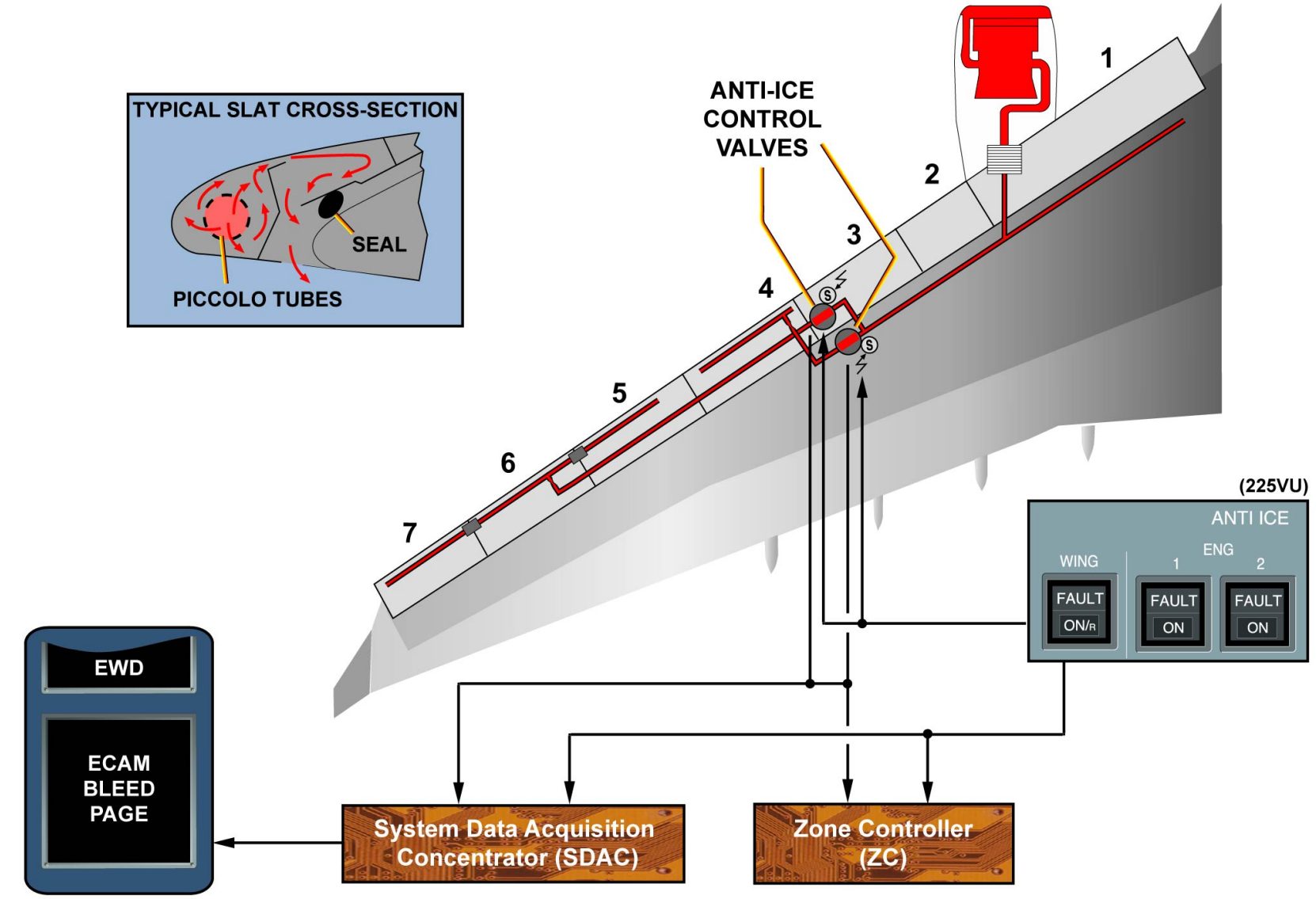

GENERAL

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WING ICE PROTECTION D/O (3)

WING ANTI-ICE AIR DUCTING DESCRIPTION

In each wing, bleed air goes through two anti-ice control valves, a telescopic duct, an in-line restrictor, a flexible duct and piccolo tubes. The telescopic duct extends and retracts with the movement of the slats, and connects the air supply from the rigid duct to the slat 4 and 6 piccolo tubes. Two flexible ducts connect the piccolo tube in slat 6 to the piccolo tubes in slats 5 and 7. The restrictor is installed downstream of each anti-ice valve. It limits the airflow to the slats. The piccolo tube releases the air into the slats through holes along their FWD length.

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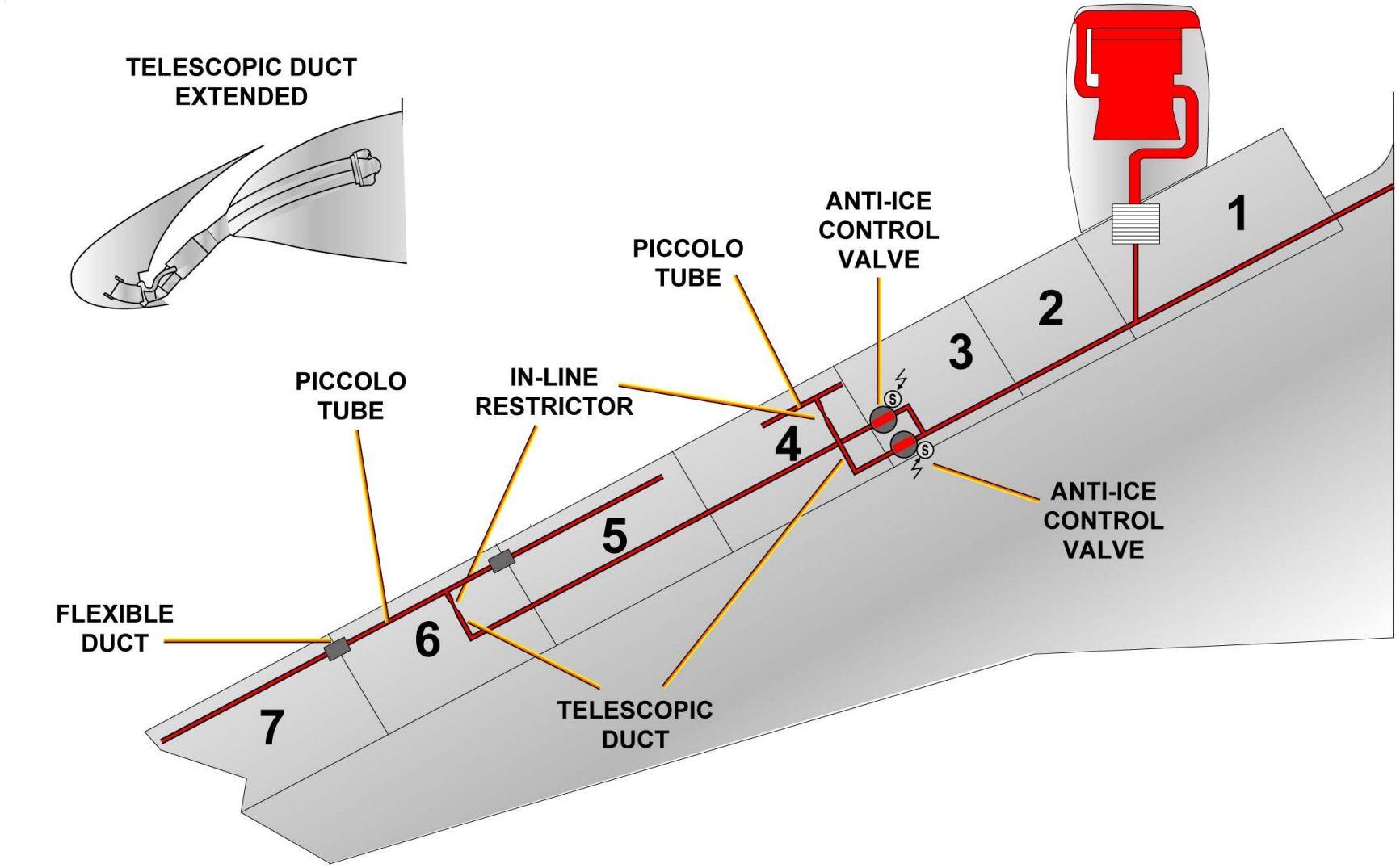

WING ANTI-ICE AIR DUCTING DESCRIPTION

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WING ICE PROTECTION D/O (3)

WING ANTI-ICE VALVE DESCRIPTION

The wing anti-ice control valve is of the butterfly type, electrically controlled and pneumatically operated. This valve fulfills the pressure regulation, the shut-off function and is spring-loaded closed. The valve outlet pressure is controlled at 22.5 ± 2.5 PSI.
Each valve is composed of:
- an actuator rod,
- a butterfly body,
- a pilot-valve assembly,
- a solenoid valve,
- a valve position microswitch,
- two pressure switches,
- two ground test connections.

The anti-ice valve is installed in the fixed leading edge of the wing and is accessible through a dedicated panel. For A/C dispatch, the valve can be manually locked in the open or closed position by means of a manual activation/deactivation device. A visual indicator shows the open or closed position of the valve butterfly.

PRESSURE REGULATING VALVE INTERNAL OPERATION

When the solenoid valve is energized, the poppet moves to the open position. This movement connects the top chamber of the actuator to the atmosphere. The upstream bleed-air pressure is transmitted to the middle chamber of the actuator. This pressure is larger than the force of the spring in the top chamber, then the actuator rod moves up and opens the butterfly.
The pressure downstream of the butterfly is transmitted to the inner chamber of the pilot valve.
When this pressure becomes greater than the force of the spring in the outer pilot-valve chamber, the diaphragm extends, which moves the check valve. This connects the upstream pressure to the top chamber of the actuator. The increase of pressure in the top chamber causes the actuator rod to move down. This moves the butterfly near the closed position, which decreases the downstream pressure.
If the downstream pressure decreases, the spring (in the pilot-valve outer chamber) moves the needle to its initial position. The pressure in the top chamber decreases and the actuator rod moves up. This moves the butterfly to the open position.
When the solenoid is de-energized, the valve butterfly is closed.

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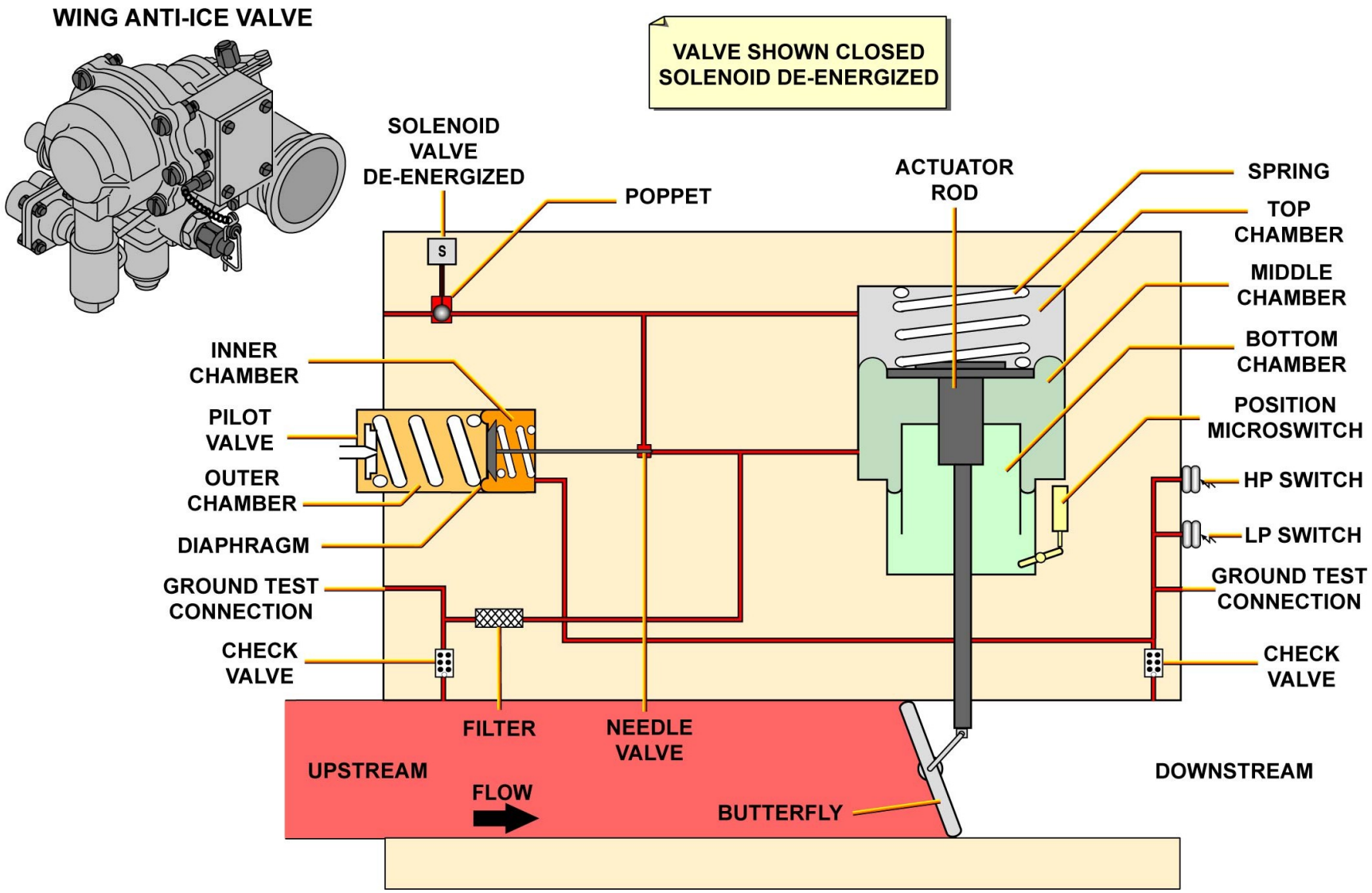

WING ANTI-ICE VALVE DESCRIPTION - PRESSURE REGULATING VALVE INTERNAL OPERATION

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WING ICE PROTECTION D/O (3)

OPERATION

This part describes the wing anti-ice system in normal and abnormal operation and monitoring.

NORMAL OPERATION

The wing anti-ice system is normally used in flight and can also be tested on ground for 30 seconds.

In flight: When the WING ANTI-ICE P/BSW is selected ON, the ON light comes on, the MODE and GROUND TEST relays are open and the CONTROL relay is closed. The valve solenoids are energized allowing the valves to open and to regulate at 22.5 ± 2.5 PSI. The WING ANTI ICE indication is displayed in green on the EWD.

The Engine Electronic Controller (EEC) or the Engine Control Unit (ECU) acquires the P/BSW configuration through the Engine Interface and Vibration Monitoring Unit (EIVMU) for engine power increase according to the bleed demand. The Zone Controller (ZC) acquires discrete inputs from the wing anti-ice system to monitor the system and manage the bleed air.

For each system, the valve position microswitch in the actuator body gives the butterfly position. This information is transmitted to the ECAM for ANTI ICE white indication and for green anti-ice valve symbol indications on the SD BLEED page. When the P/BSW is released out, the valve solenoids are de-energized and the valves close, no indication is displayed on the BLEED page of the SD.

On ground: Landing Gear Control and Interface Unit 1 (LGCIU1) sends a ground signal to the MODE relay.

When the WING ANTI-ICE P/BSW is selected ON, the MODE relay is energized and the GROUND TEST relay is open for 30 seconds. Consequently the CONTROL relay is also closed for 30 seconds allowing the valves to be energized for a limited time, thus preventing the slats from overheating. After 30 seconds, the GROUND TEST relay closes and de-energizes the valves through the CONTROL relay.

A functional test of the valve is possible using APU bleed air. For that purpose the APU Electronic Control Box (ECB) receives a discrete from the GROUND TEST relay to boost the bleed air during the ground wing anti-ice test.

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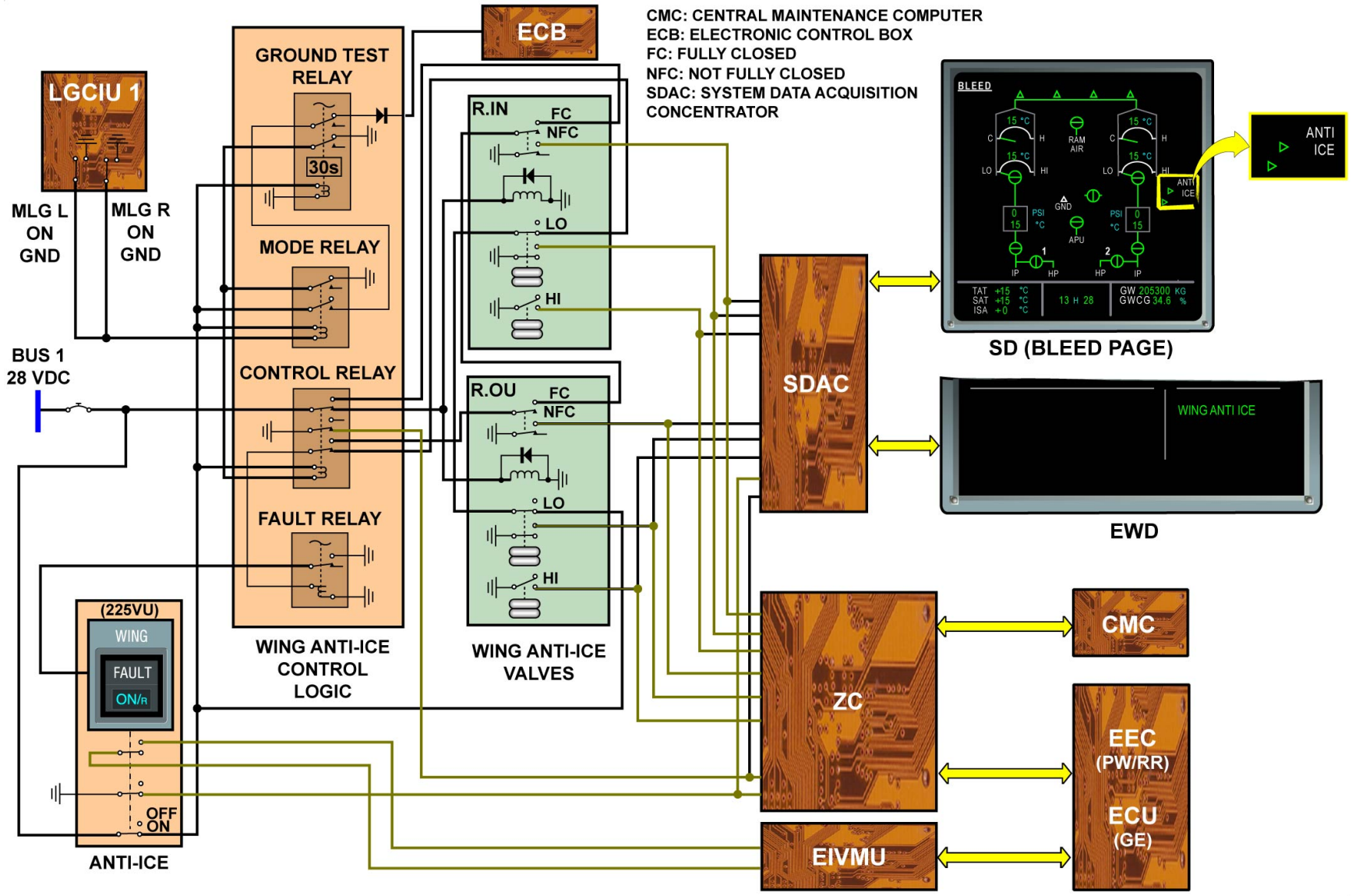

OPERATION - NORMAL OPERATION

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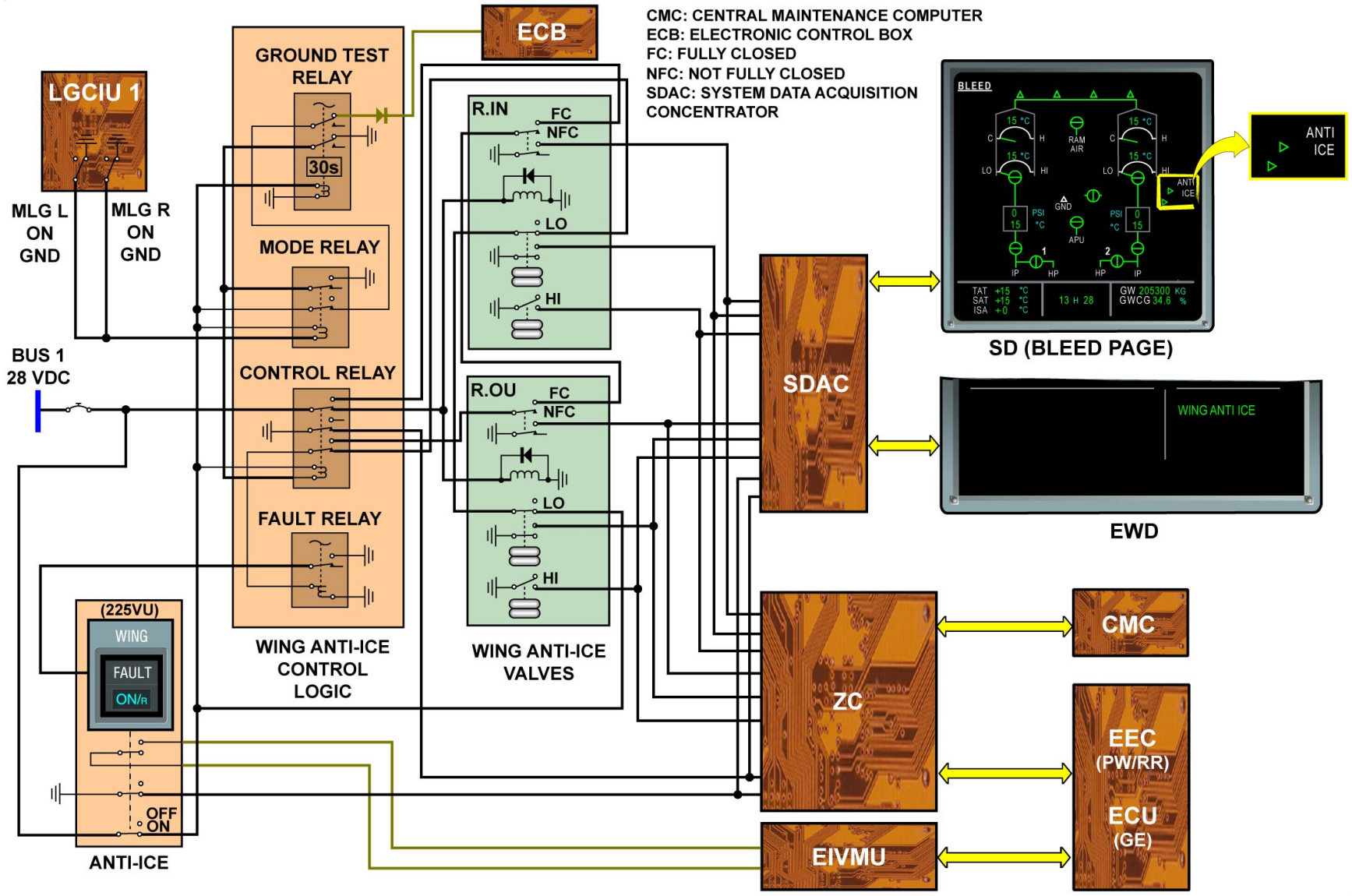

OPERATION - NORMAL OPERATION

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WING ICE PROTECTION D/O (3)

OPERATION (continued)

ABNORMAL OPERATION

A failure is detected by a logic that combines the P/BSW switch position, the status of the valve position microswitch and the LP switch state.

When the WING ANTI ICE P/BSW is selected ON and the valve is not open, the associated LP switch controls the FAULT relay to open. The P/BSW FAULT legend comes on. The A.ICE WING VALVE NOT OPEN warning message is displayed on the ECAM. On the BLEED page of the SD, the ANTI ICE indication is displayed in amber.

When the WING ANTI ICE P/BSW is selected off but the valve is not closed, as detected by the microswitch, the P/BSW FAULT legend comes on. The A.ICE L(R) INR(OUTR) WING OPEN warning message is triggered on the ECAM.

The wing anti-ice system is only used in flight so, on ground, the valves must be closed (except during test). In this condition, if the valves are open, the A.ICE WING OPEN ON GND warning message is triggered on the ECAM and the P/BSW FAULT legend comes on.

When a wing anti-ice control relay failure is detected, the A.ICE WAI SYS FAULT warning message is displayed on the ECAM. The P/BSW FAULT legend comes on.

When the system is ON and any valve is open with a LP detection (13.5 ± 0.5 PSI), the A.ICE L(R) INR(OUTR) LO PR message is displayed on the ECAM and the FAULT light comes on, on the P/BSW.

At the same time, fault messages are sent to the Central Maintenance Computer (CMC) via the ZC.

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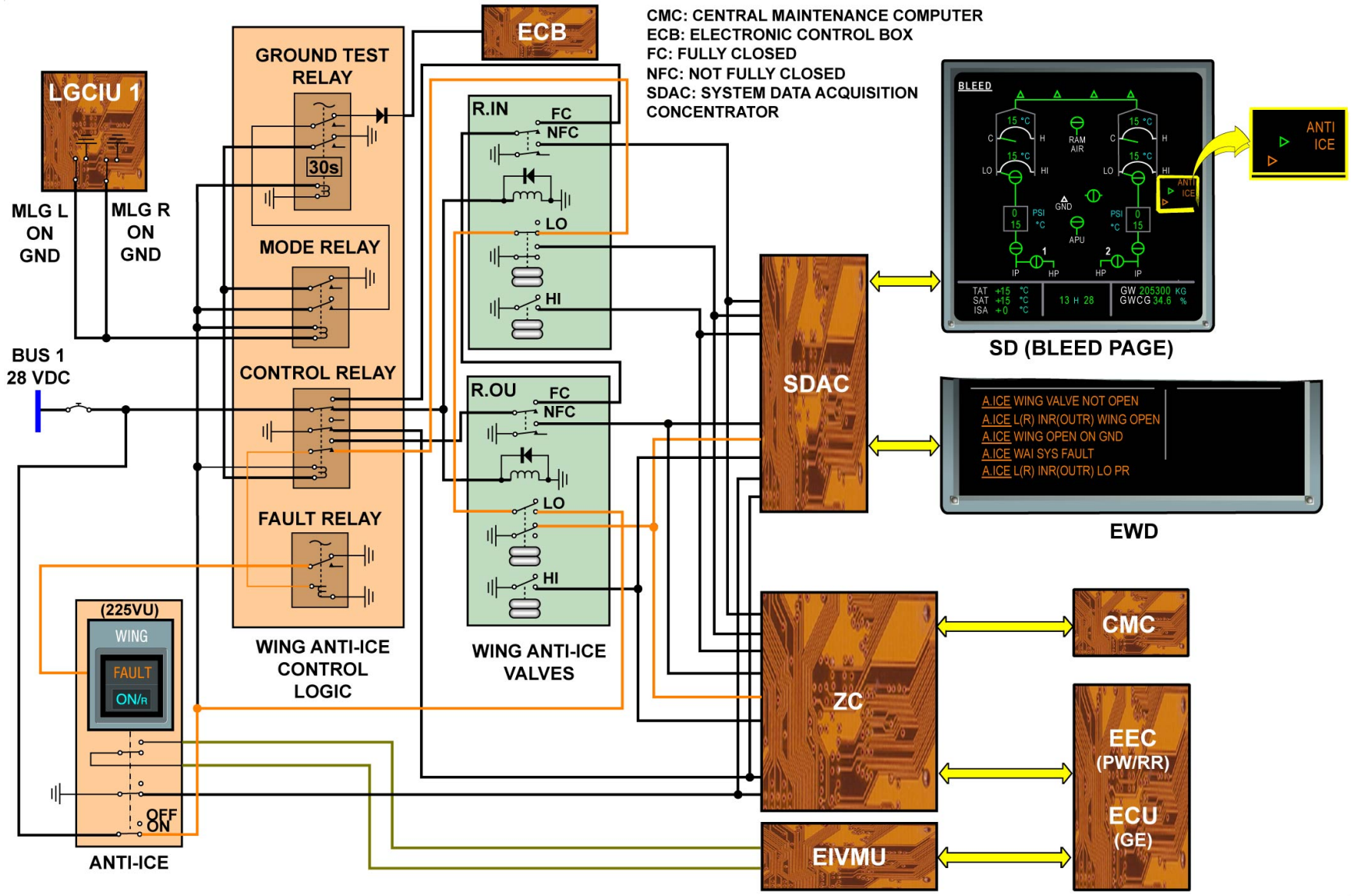

OPERATION - ABNORMAL OPERATION

WING ICE PROTECTION D/O (3)

OPERATION (continued)

MONITORING

On the ground, the wing ice-protection system test starts when the WING ANTI ICE P/BSW is selected ON. If the test continues for more than 35 seconds, the ECAM shows the warning message A.ICE GND TST OVRUN. The crew must then stop the operation of the wing ice-protection system to prevent heat damage to the slats.
During valve operation, if the downstream pressure increases to 31 ± 1 PSI, the related High Pressure (HP) switch gives an HP signal and the A.ICE L(R) INR(OUTR) HI PR warning message is displayed on the ECAM. The valve symbol and the ANTI ICE indication are displayed in amber color on the SD BLEED page.
In those two cases, with warning messages displayed on the ECAM, the P/BSW FAULT legend is not on

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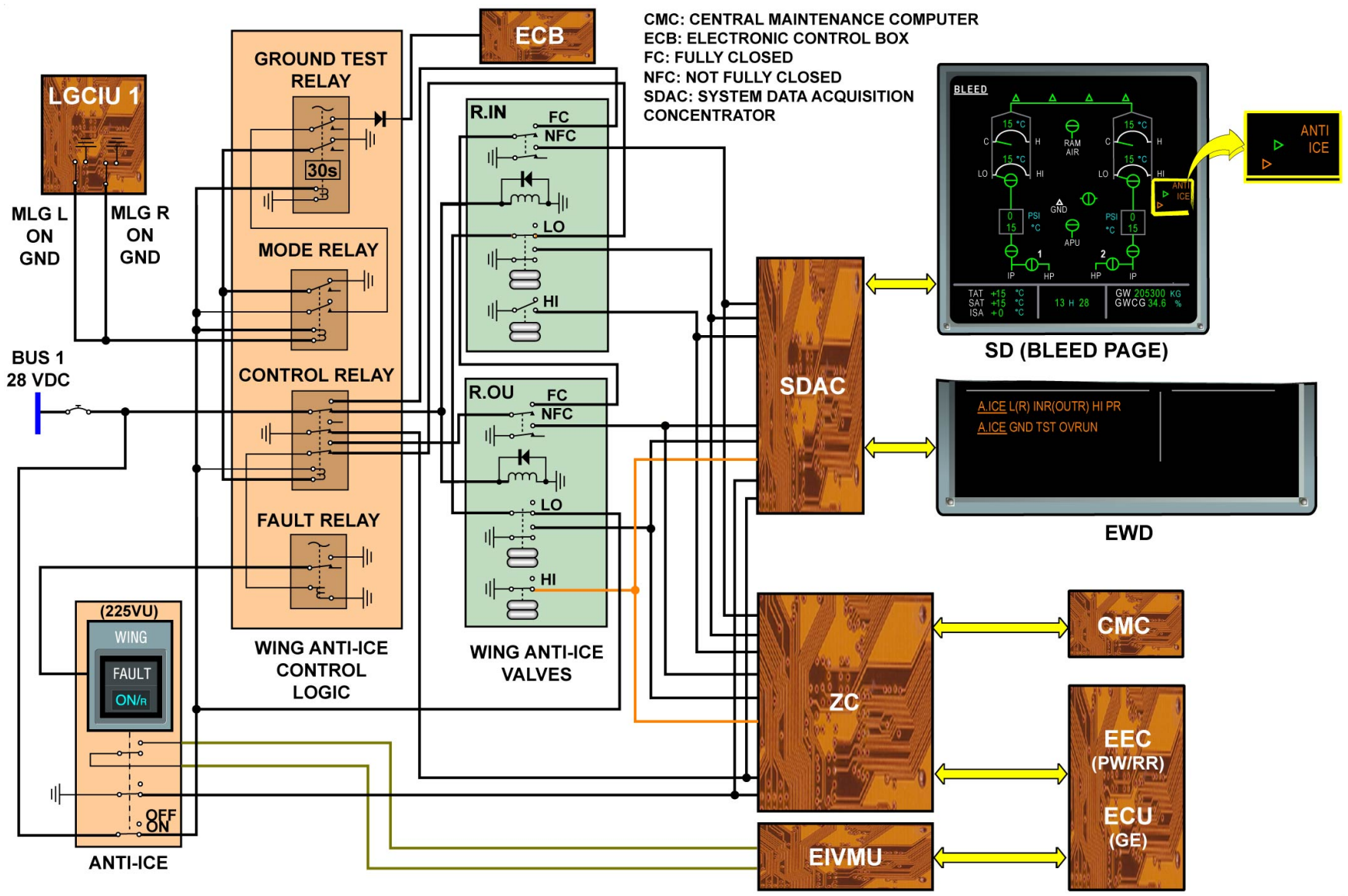

OPERATION - MONITORING

ENGINE AIR INTAKE ICE PROTECTION D/O (3)

GENERAL

Engine air intake ice protection is achieved by heating the nose cowl lip with air bleed from the third stage of the engine compressor.

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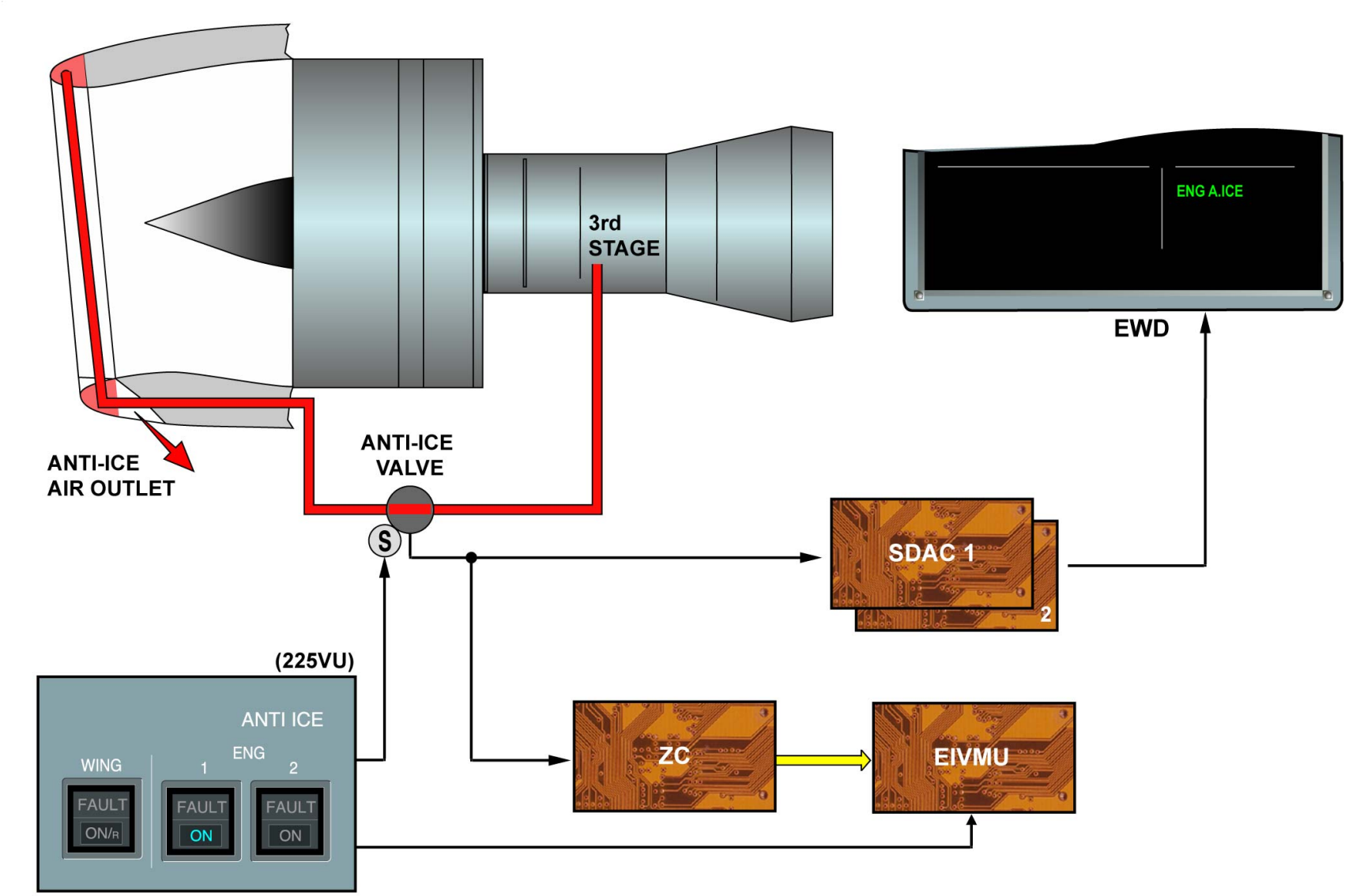

GENERAL

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ENGINE AIR INTAKE ICE PROTECTION D/O (3)

ENGINE ANTI-ICE AIR DUCTING DESCRIPTION

The air bleed from the engine compressor goes through duct sections, a pressure-regulating anti-ice valve and a venturi restrictor. Air is then sprayed through a piccolo tube into the nose cowl lip. The ducting is in four sections, three engine mounted (upper, lower and FWD) and one mounted in the fan cowl. The venturi restrictor is installed at the interface between the feed duct and the FWD duct. It limits the bleed airflow of the third stage in case of duct rupture.

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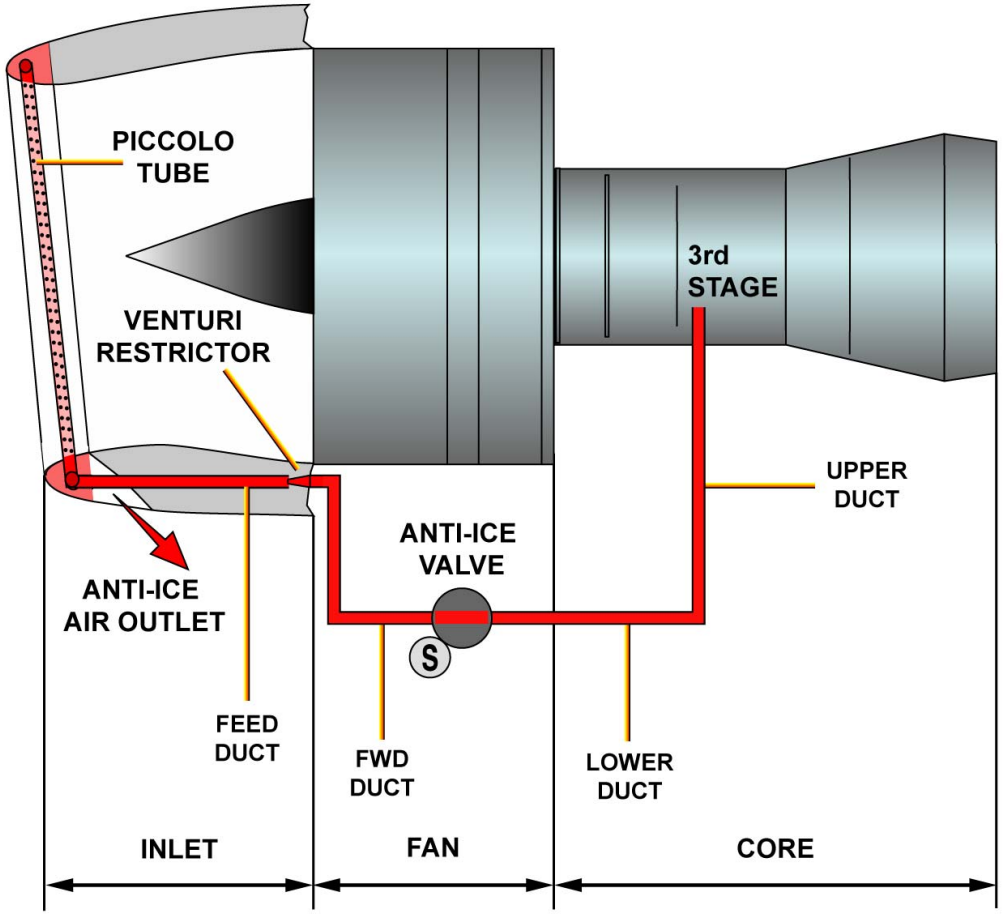

ENGINE ANTI-ICE AIR DUCTING DESCRIPTION

ENGINE AIR INTAKE ICE PROTECTION D/O (3)

ENGINE ANTI-ICE VALVE DESCRIPTION

The engine anti ice valve is of the butterfly type, electrically controlled and pneumatically actuated. This valve performs both pressure regulation and shut-off and is spring-loaded open. When the valve operates, it regulates the maximum downstream air pressure to 62 psi.
The engine anti-ice valve has:
- a butterfly valve sub-assembly,
- an actuator sub-assembly,
- a pilot regulator sub-assembly,
- HP and LP pressure switches,
- one filter,
- an ON/OFF solenoid.

The valve is installed on the lower left hand side of the engine. The bleed air source is taken on the HP compressor on the right hand side of the engine. The ENGine ANTI ICE panel gives access to the inlet tube. The fan cowl doors give access to the engine anti-ice valve.
The valve can be manually locked in the fully open or fully closed position by means of a hexagon selector. On the valve, a visual indicator shows the valve position.

ENGINE ANTI-ICE INTERNAL OPERATION

When the solenoid is de-energized, the solenoid poppet moves to the spring-loaded retract position, and inlet air pressurizes the extend side of the actuator. This pressure combined with actuator spring force and the clock spring forces overcome the air pressure on the retract side of the actuator, so the piston moves to the open position. Once the valve is open, the pilot regulator makes sure that a constant outlet pressure of 62 psi is maintained by balancing the air pressure in the piston chambers.
When the solenoid is energized, the solenoid poppet moves to block the airflow to the extend side of the piston, thus the air pressure increases on the actuator retract side, so that the butterfly valve closes.

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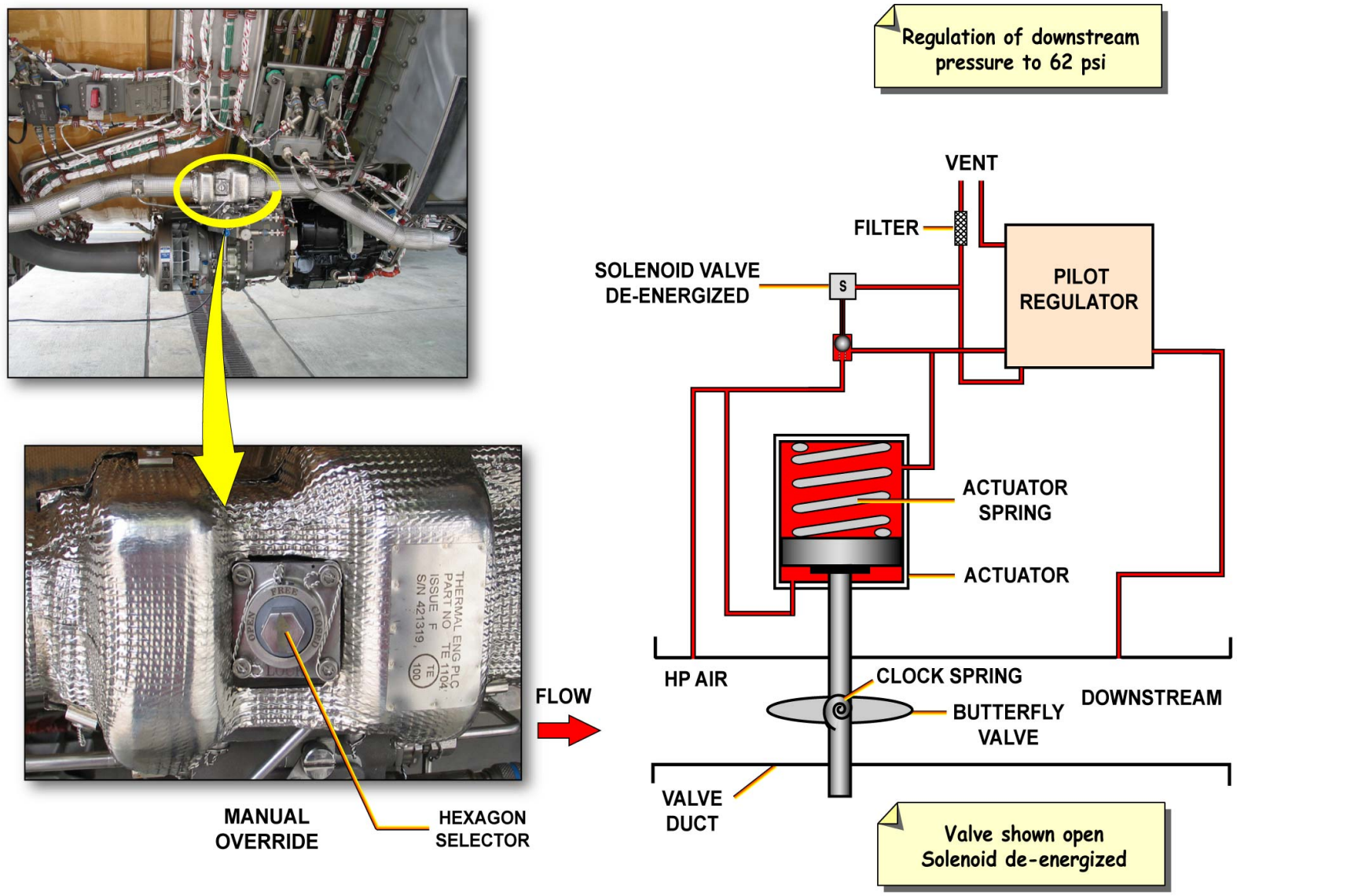

ENGINE ANTI-ICE VALVE DESCRIPTION - ENGINE ANTI-ICE INTERNAL OPERATION

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ENGINE AIR INTAKE ICE PROTECTION D/O (3)

ENGINE ANTI-ICE VALVE OPERATION

This topic describes the normal, abnormal operation and the engine anti-ice valve monitoring.

NORMAL OPERATION

When the engine operates and the ENG ANTI ICE P/BSW is selected ON:
- the valve solenoid is de-energized,
- the valve opens and regulates at 62 psi.

The valve LP switch is used to detect the open position of the valve when the pressure is more than 6 psi. This information is transmitted to the ECAM for ENG A. ICE green memo indication on the EWD.
The Engine Interface and Vibration Monitoring Unit (EIVMU) acquires the configuration of the ENG ANTI ICE P/BSW and transmits it to the Engine Electronic Controller (EEC).
The Zone Controller (ZC) uses the position of the ENG ANTI ICE P/BSW or the position of the engine anti-ice valve (provided by the LP switch) to calculate the bleed status coefficients.
When the ENG ANTI ICE P/BSW is selected off, the solenoid is energized and the valve closes. No indication is then displayed on the memo area of the EWD.

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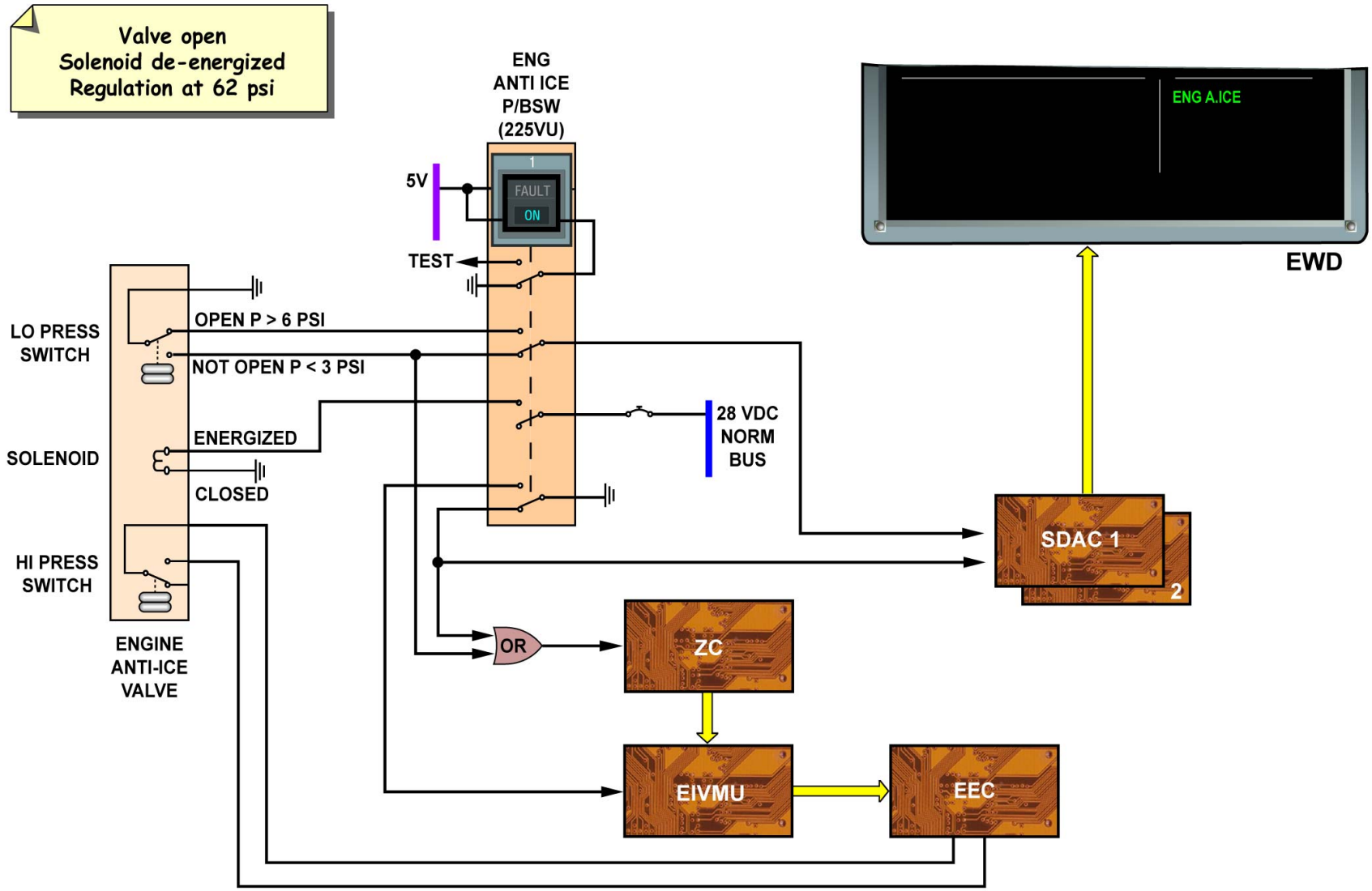

ENGINE ANTI-ICE VALVE OPERATION - NORMAL OPERATION

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ENGINE AIR INTAKE ICE PROTECTION D/O (3)

ENGINE ANTI-ICE VALVE OPERATION (continued)

ABNORMAL OPERATION

A failure is detected by a logic that combines the P/BSW configuration and the pressure downstream of the engine anti-ice valve.
When the ENG ANTI ICE P/BSW is selected ON but the valve is not open, the P/BSW FAULT legend comes on through the FAULT relay. The A.ICE ENG 1 (or 2) VALVE CLOSED and AVOID ICING CONDITIONS warning messages are triggered on the EWD.
When the ENG ANTI ICE P/BSW is selected off but the valve is not closed, the P/BSW FAULT legend comes on. Then, the A. ICE ENG 1 (or 2) VALVE OPEN warning message is triggered on the EWD.

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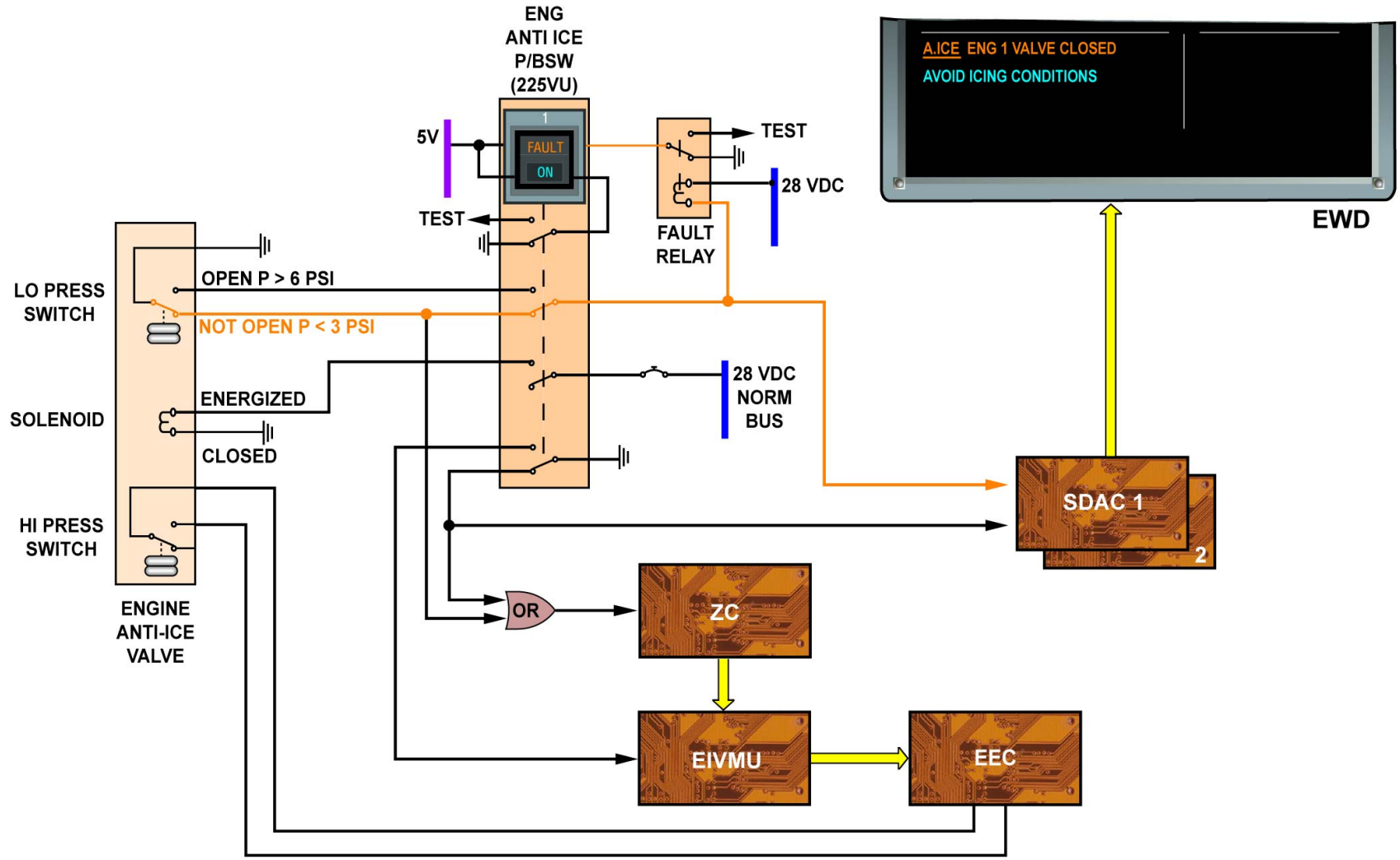

ENGINE ANTI-ICE VALVE OPERATION - ABNORMAL OPERATION

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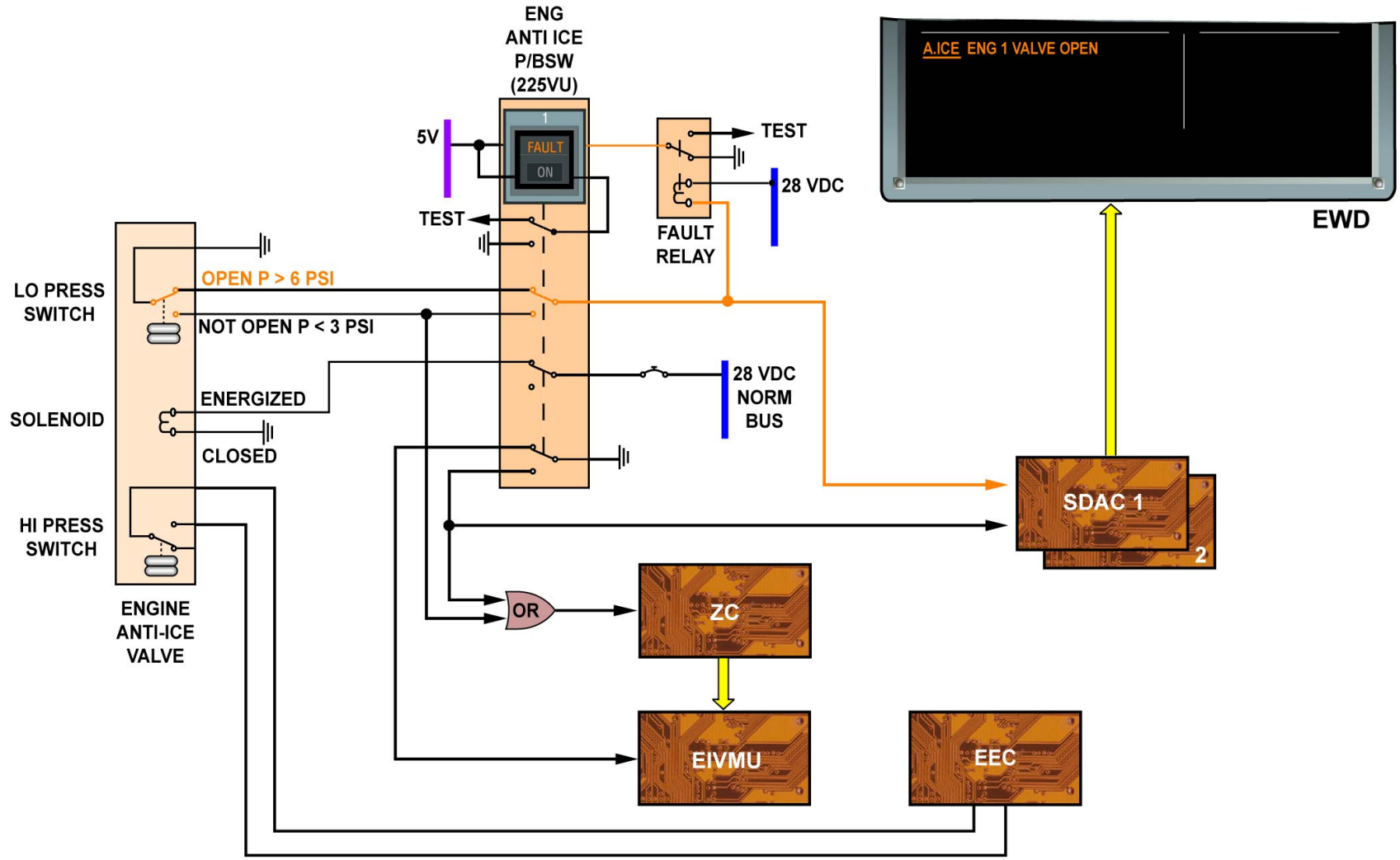

ENGINE ANTI-ICE VALVE OPERATION - ABNORMAL OPERATION

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ENGINE AIR INTAKE ICE PROTECTION D/O (3)

ENGINE ANTI-ICE VALVE OPERATION (continued)

ENGINE ANTI-ICE VALVE MONITORING

The valve switch monitors the regulation function of the valve. The pressure operating setting of this switch is 85 psi (maximum rising pressure) to 72 psi (minimum falling pressure).
If the engine anti-ice valve downstream pressure increases above the normal regulation range and reaches 85 psi, a class 2 fault message is triggered by the EEC..

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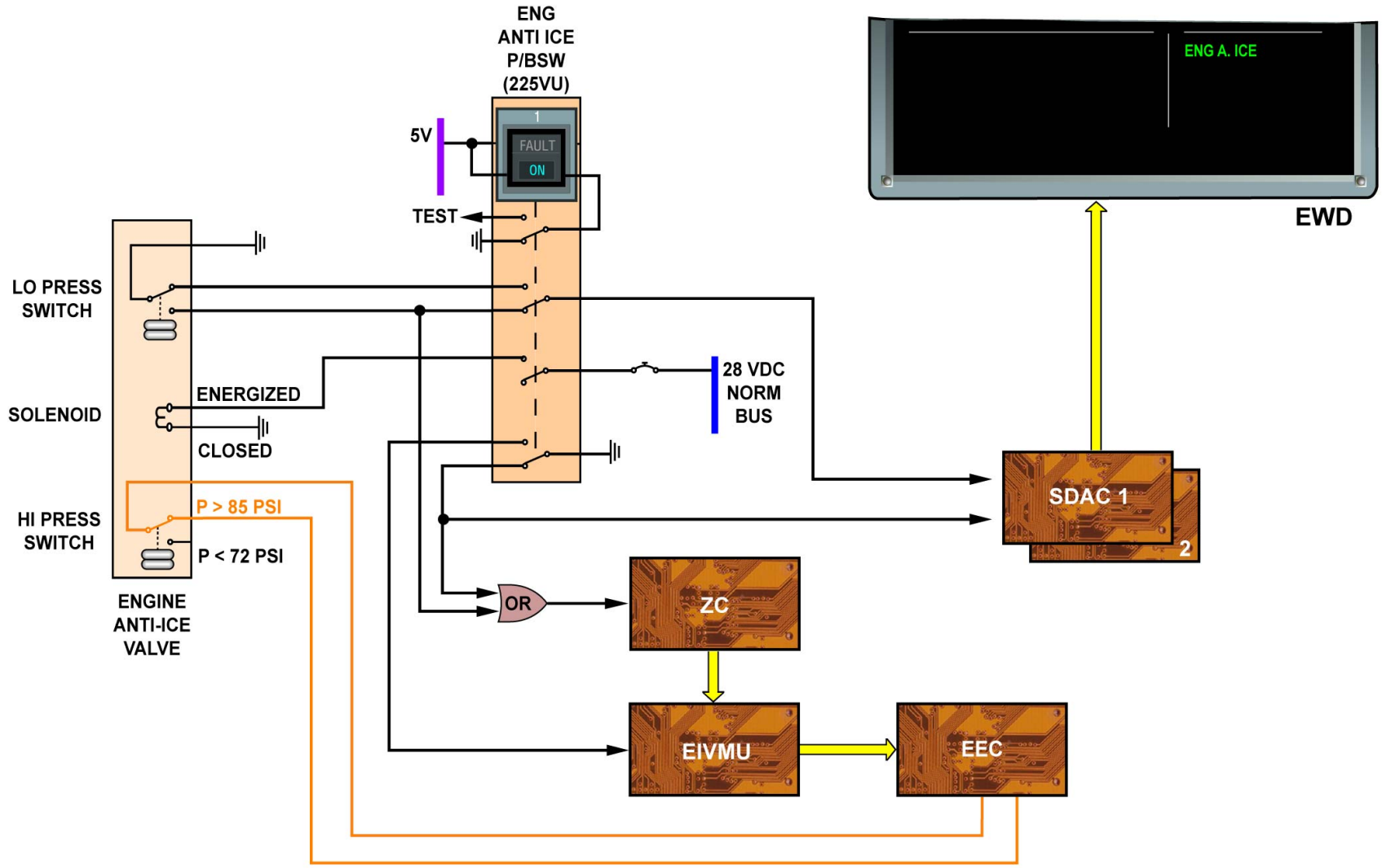

ENGINE ANTI-ICE VALVE OPERATION - ENGINE ANTI-ICE VALVE MONITORING

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PROBE ICE PROTECTION D/O (3)

GENERAL

The function of the probe ice protection system is to supply probe electrical heating to prevent ice formation.
An electrical heating system integral with each probe operates to maintain probe efficiency.
The Probe Heat Computer (PHC) carries out permanent monitoring of probes automatically.
In cases of severe icing conditions on ground, automatic operation can be overridden by means of the Probe & Windows Heat P/BSW.

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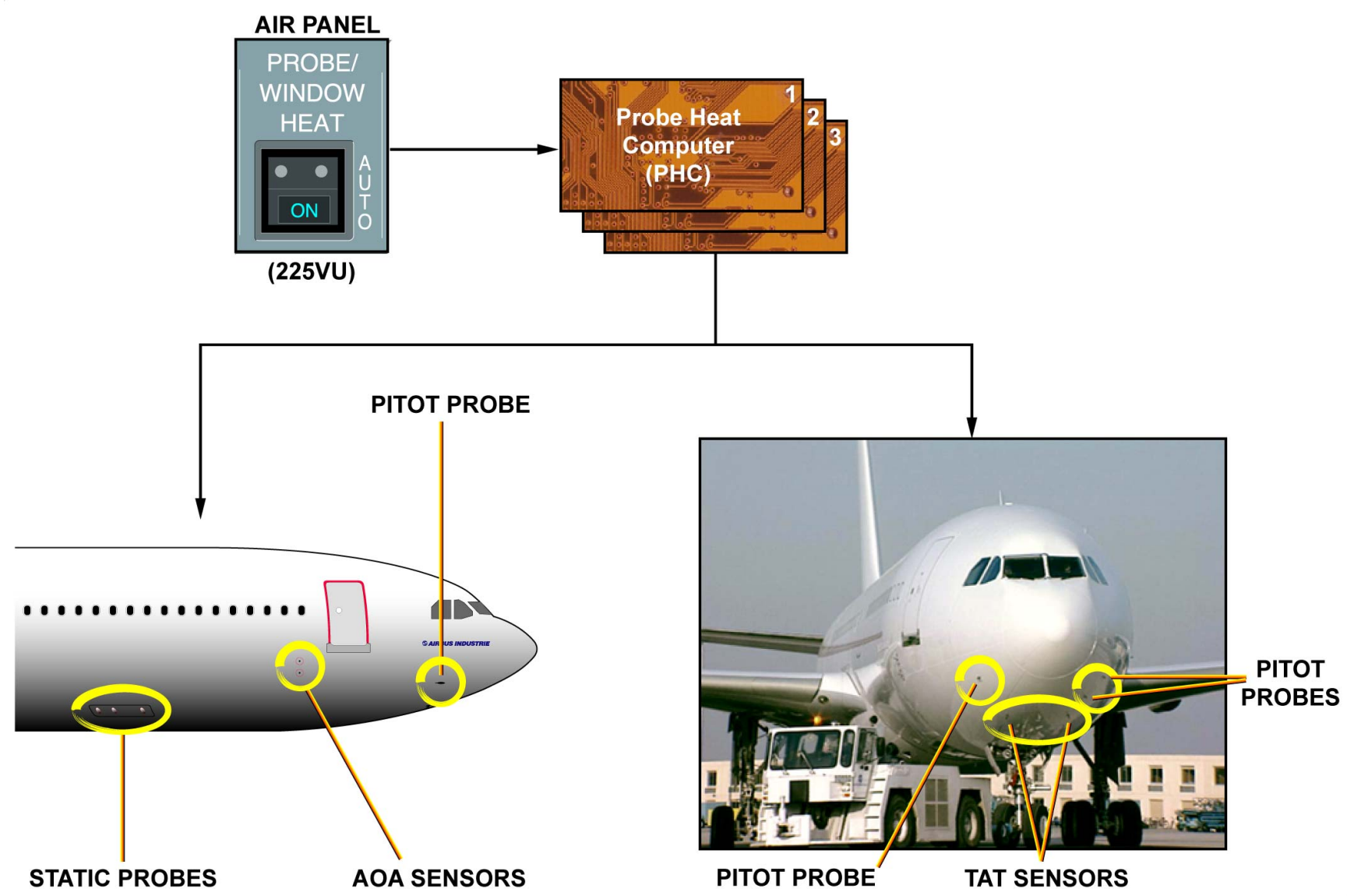
AIR PANEL
PROBE/
WINDOW
HEAT
ON
AUTO
(225VU)
Probe Heat
Computer
(PHC)
1
2
3
PITOT PROBE
STATIC PROBES
AOA SENSORS
PITOT
PROBES
PITOT PROBE
TAT SENSORS

GENERAL

PROBE ICE PROTECTION D/O (3)

CONTROL AND OPERATION

Captain, First Officer and standby probes are heated by independent systems controlled by a PHC. The standby system has no Total Air Temperature (TAT) probe.
The heated probes are: static ports, Angle Of Attack (AOA), pitot and TAT. Probes and static ports are automatically heated when engine 1 or 2 (engine 2 or 3 for A340) is started on ground or in flight using the landing gear status. TAT probes are heated only in flight and pitot probes have 2 heating levels, low on ground and normal in flight. The PROBE & WINDOW HEAT P/BSW overrides the automatic operation.
In case of a probe-heating fault, the PHC sends an output to the Flight Warning Computer (FWC), via the Air Data/Inertial Reference Unit (ADIRU), which starts an ECAM and an aural warning. The PHC also transmits fault messages to the Central Maintenance Computer (CMC).

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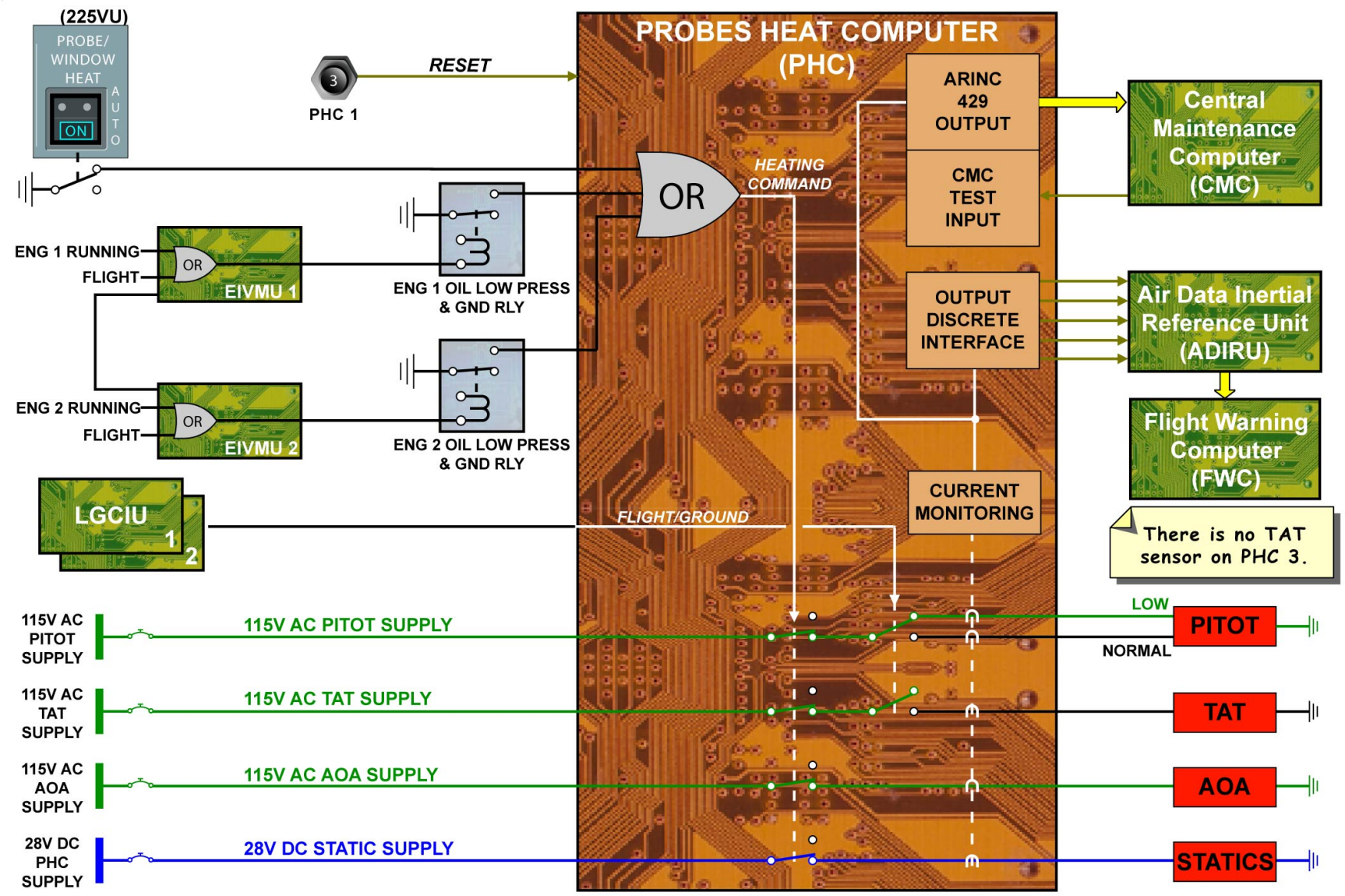

CONTROL AND OPERATION

PROBE ICE PROTECTION D/O (3)

CONTROL AND OPERATION (continued)

EIVMU 1 FAILURE

In case of the Engine Interface Vibration Monitoring Unit (EIVMU) 1 failure, the ENG 1 OIL LOW PRESS & GrouND relay is not energized and causes the related probes and static ports to be heated. The PHCs still get the engine status (flight, running or not) from the second EIVMU via the crosstalk link.

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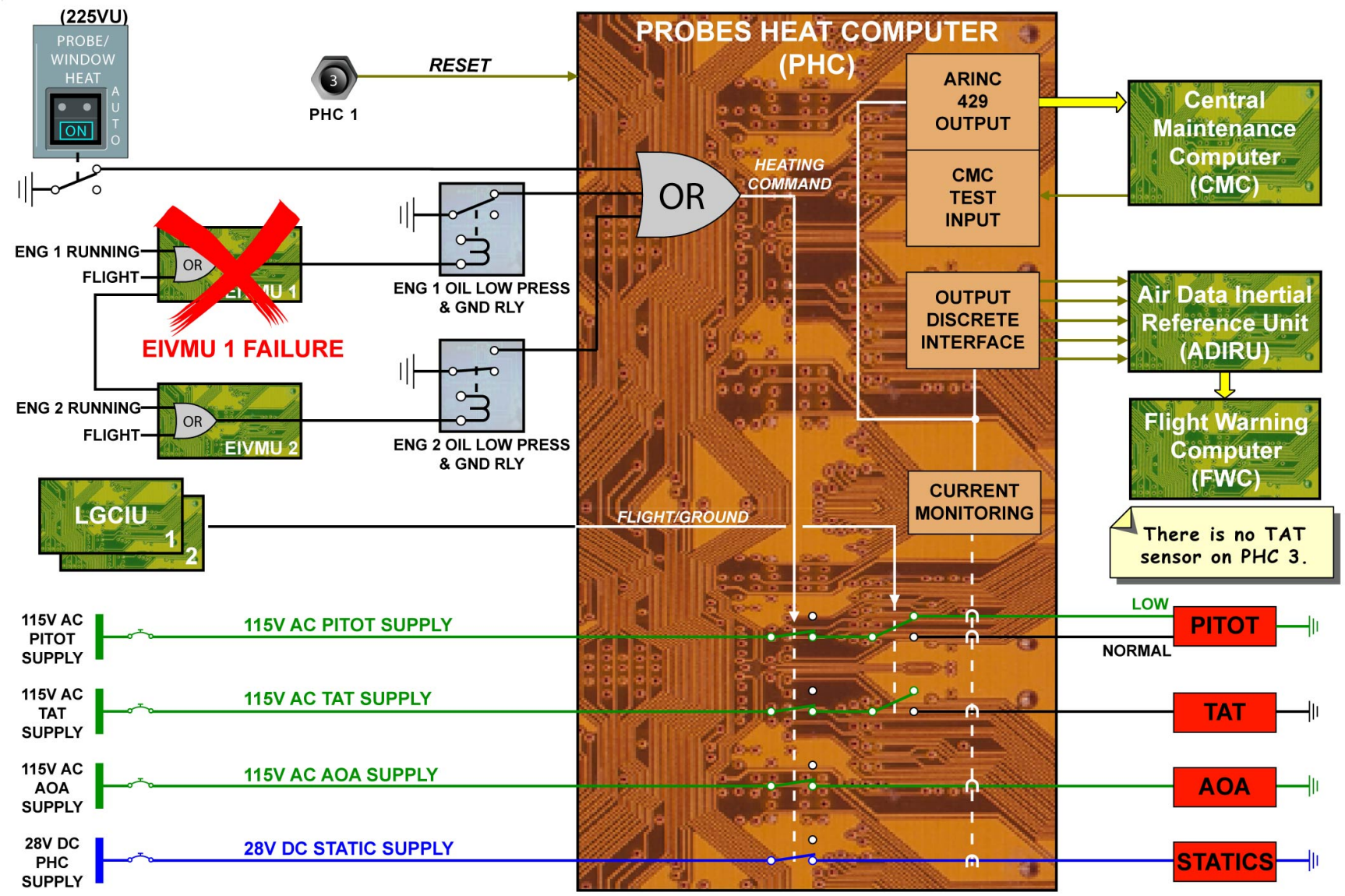

CONTROL AND OPERATION - EIVMU 1 FAILURE

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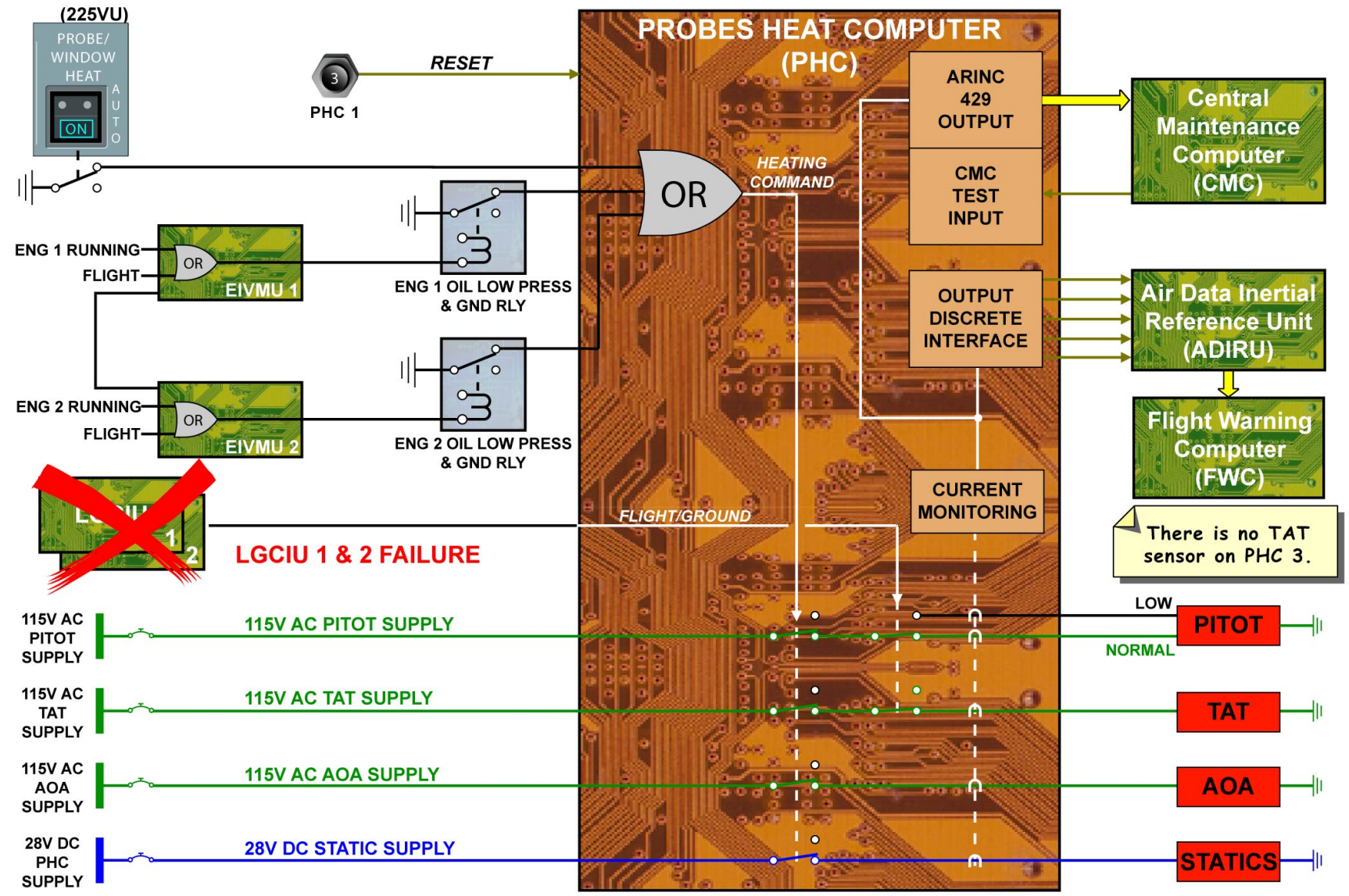
PROBE ICE PROTECTION D/O (3)

CONTROL AND OPERATION (continued)

LGCIU 1 AND 2 FAILURE

In case of both Landing Gear Control and Interface Units (LGCIUs) failure, the PHCs automatically control and select the heating mode of the probes. The pitot probe heating is set to the normal heating mode and the TAT sensor heating is activated.

G9409341 - GAUT0T0 - FM30D7000000001



CONTROL AND OPERATION - LGCIU 1 AND 2 FAILURE

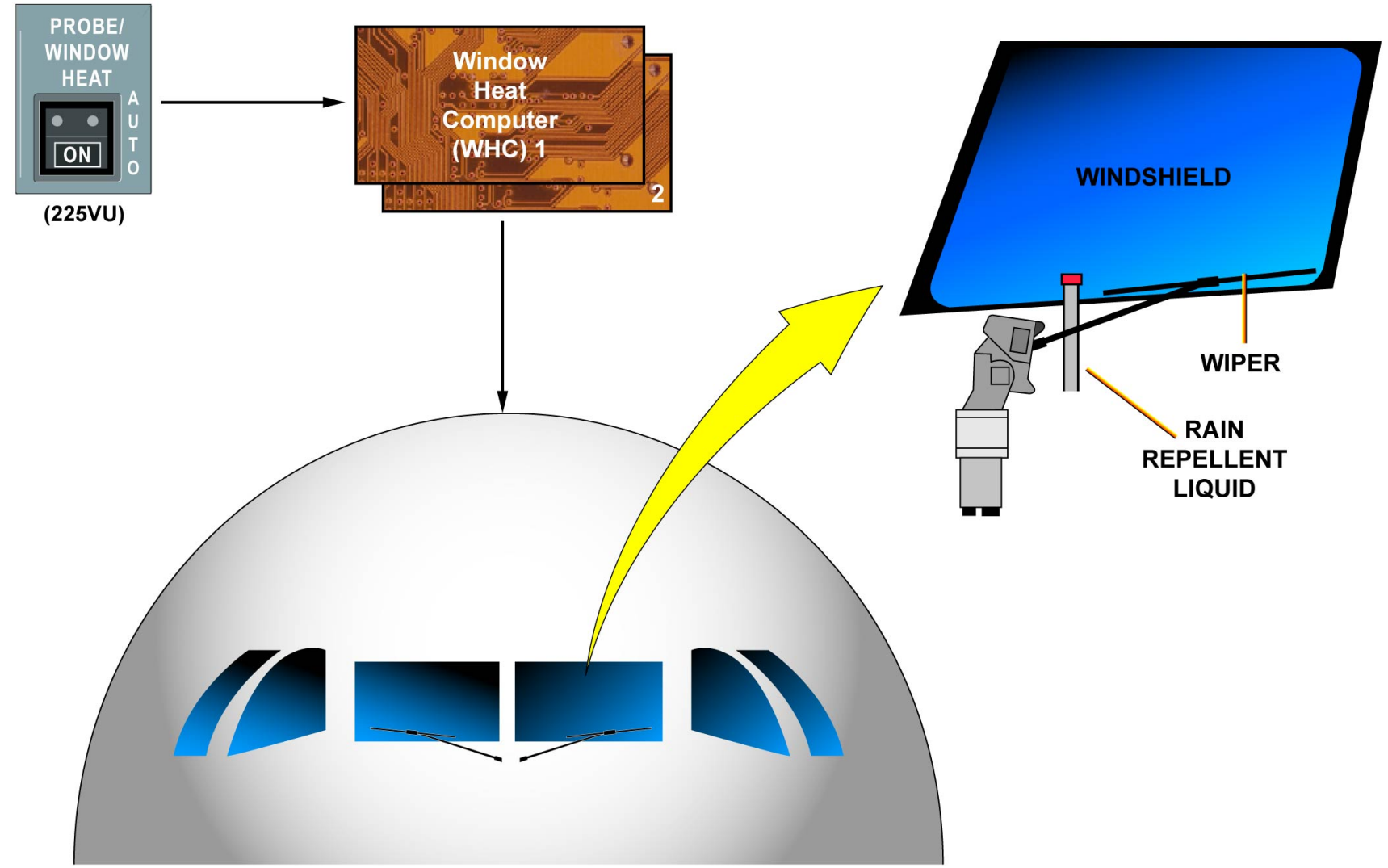
G9409341 - GAUT0T0 - FM30D7000000001

WINDSHIELD A.ICE/DEFOGGING & RAIN PROT D/O (3)

COCKPIT WINDOWS ANTI-ICE DEFOGGING AND RAIN PROTECTION GENERAL

The anti-icing and defogging system keeps a clear visibility through the windshield and windows in icing or foggy conditions. This is achieved by electrical heating of the windshield and windows. In heavy rain conditions, rain removal from the windshield is done by two independent wipers and a rain repellent liquid, stored in a pressurized bottle, which may be sprayed onto the windshield to improve visibility.

G9409341 - GAUT0T0 - FM30D8000000001



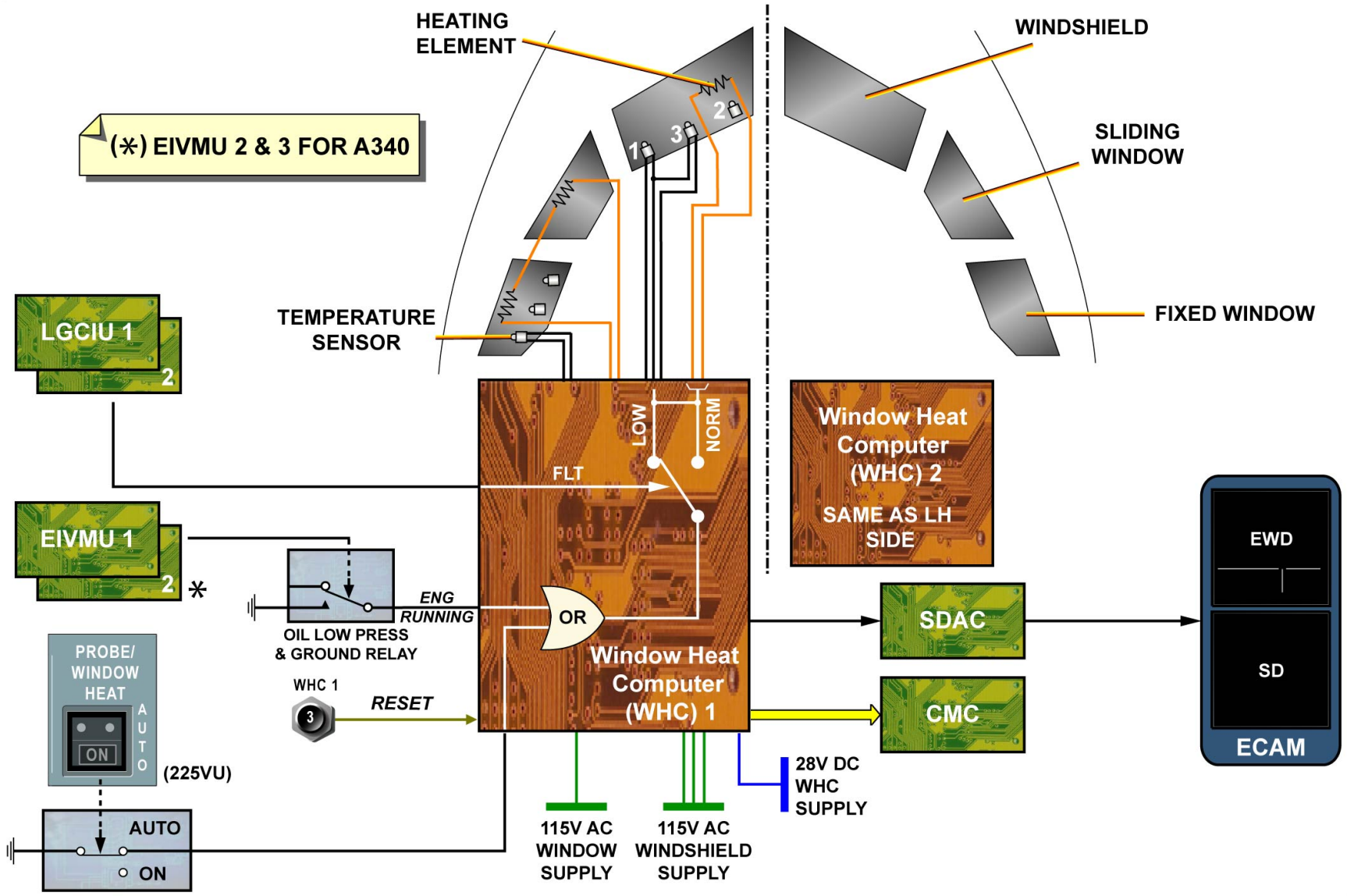
COCKPIT WINDOWS ANTI-ICE DEFOGGING AND RAIN PROTECTION GENERAL

WINDSHIELD A.ICE/DEFOGGING & RAIN PROT D/O (3)

ANTI-ICE AND DEFOGGING CONTROL AND MONITORING

Heating is automatically initiated at first engine start-up (inboard engine for A340) and stops at last engine shut-down. The PROBE & WINDOW HEAT P/BSW overrides the automatic operation.
Monitoring and overheat protection control are achieved by two fully independent Window Heat Computers (WHCs), one for each side. For the windshield, there are 2 heating levels, low on ground and normal in flight and only one heating level for windows. Fixed and sliding windows are heated in series. Ground/flight information is given by the status of the landing gear.
The WHC controls the windshield and windows temperature heating using temperature feedback from the temperature sensors. There are 3 sensors installed on the windshield and 3 sensors installed on each fixed window.
The WHC is connected to two sensors of the windshield and one sensor of each fixed window. If one sensor (N°1) of the windshield fails, the WHC automatically switches to the second sensor (N°3) without any maintenance action (first sensor failure identified by related class 3 Central Maintenance Computer (CMC) fault message). The third sensor (N°2) has to be connected manually at terminal block level. In case of a window-heating fault, the WHC sends an output to the ECAM via the System Data Acquisition Concentrator (SDAC). The WHC also transmits fault messages to the CMC.

G9409341 - GAUT0T0 - FM30D8000000001



ANTI-ICE AND DEFOGGING CONTROL AND MONITORING

G9409341 - GAUT0T0 - FM30D8000000001

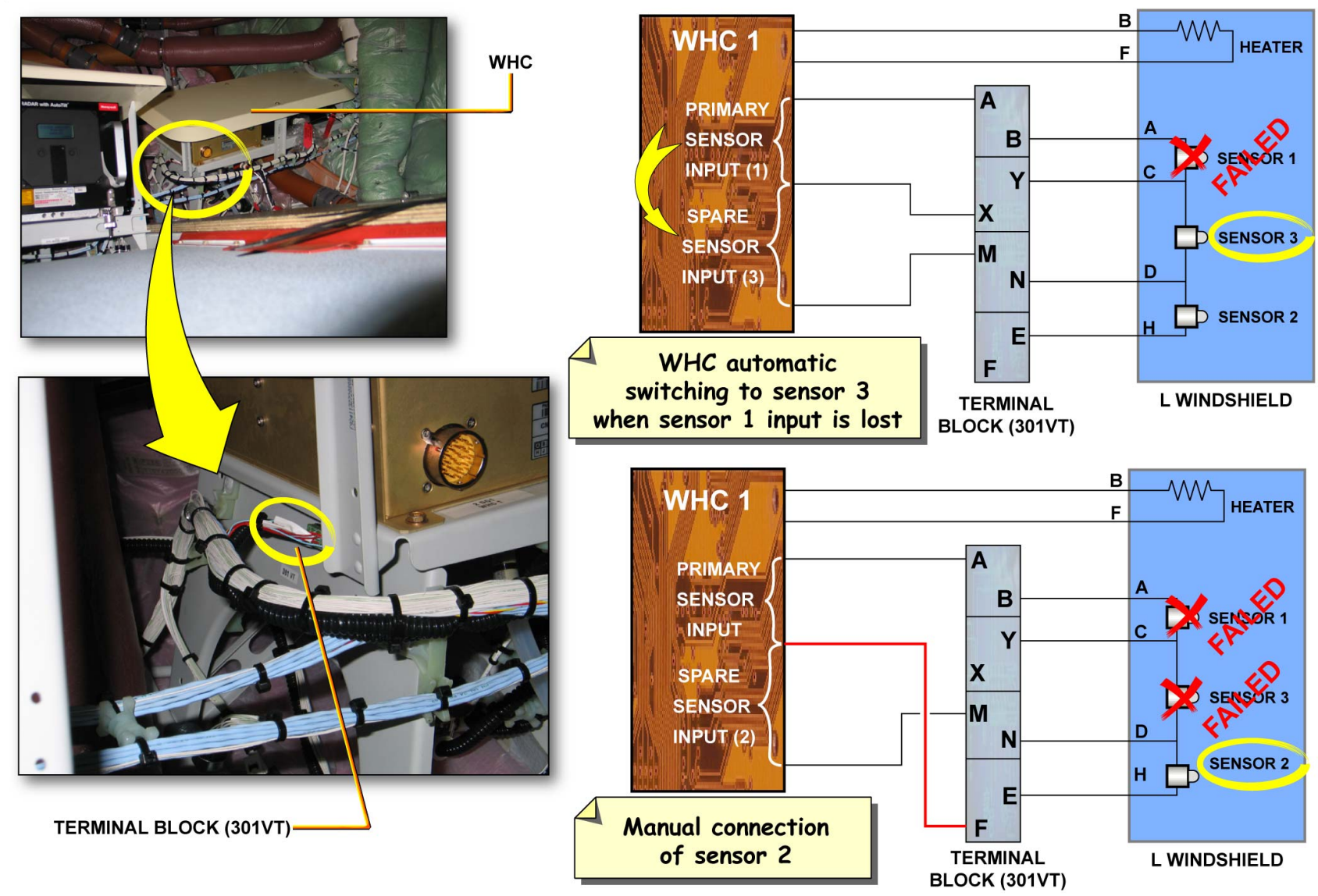
WINDSHIELD A.ICE/DEFOGGING & RAIN PROT D/O (3)

ANTI-ICE AND DEFOGGING CONTROL AND MONITORING (continued)

WINDSHIELD SPARE TEMPERATURE SENSOR CONNECTION

Out of the three temperature sensors installed in each windshield, two are permanently connected to the related WHC, sensor 1 and sensor 3. In case of failure of sensor 1, the WHC does an automatic switching to sensor 3, and triggers a class 3 fault messages.
The connection of the third sensor is done at terminal block level, by disconnecting the wiring from pin X and connecting it to pin F.

G9409341 - GAUT0T0 - FM30D8000000001



ANTI-ICE AND DEFOGGING CONTROL AND MONITORING - WINDSHIELD SPARE TEMPERATURE SENSOR CONNECTION

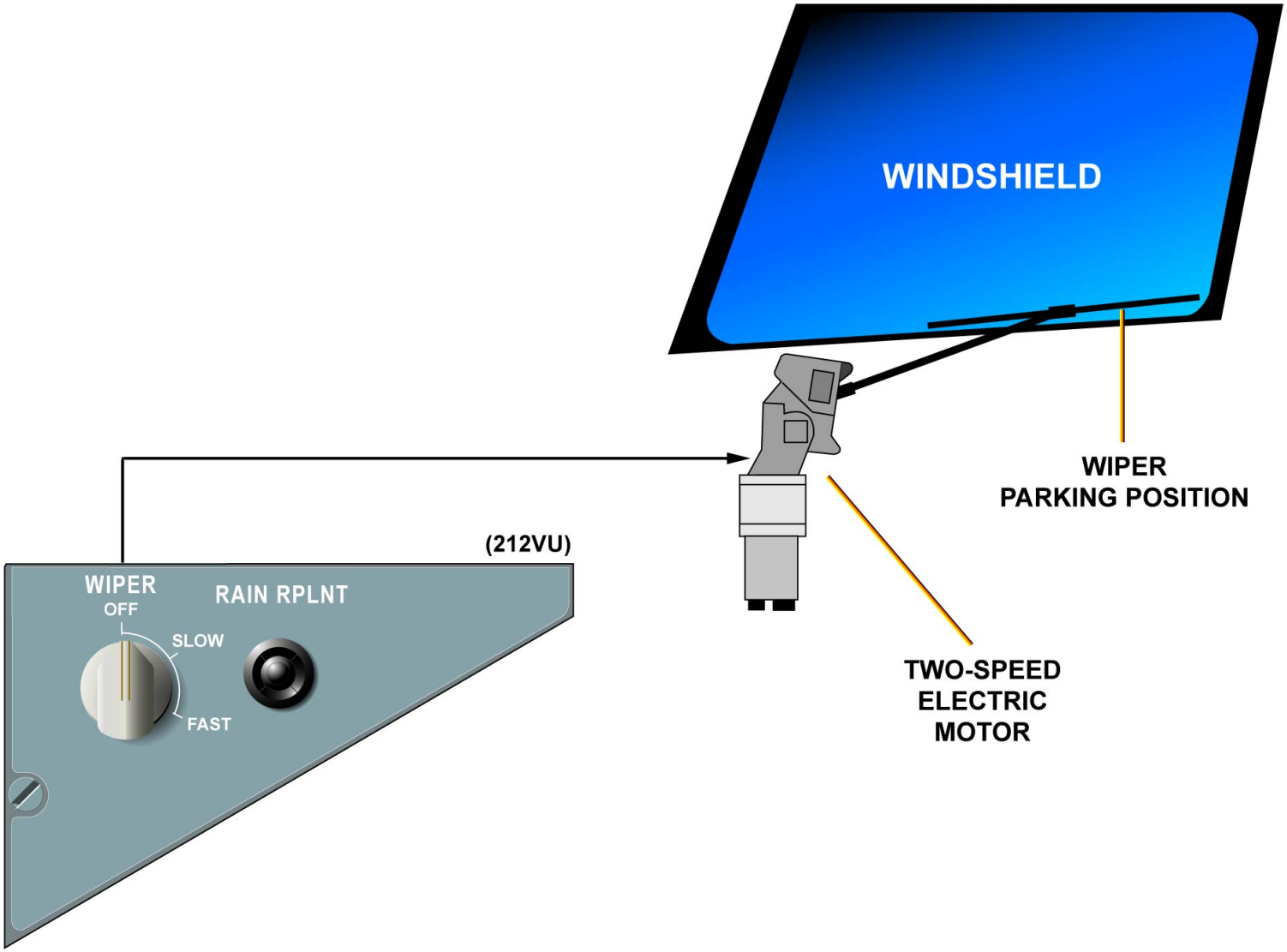
G9409341 - GAUT0T0 - FM30D8000000001

WINDSHIELD A.ICE/DEFOGGING & RAIN PROT D/O (3)

WIPER SYSTEM

Each wiper is independently actuated by a two-speed electric motor controlled by the WIPER control selector located on the overhead panel. SLOW or FAST speed can be selected. When the selector is set to OFF, the wiper stops in the parking position on the lower part of the windshield and is lifted off the aircraft structure.

G9409341 - GAUT0T0 - FM30D8000000001



WIPER SYSTEM

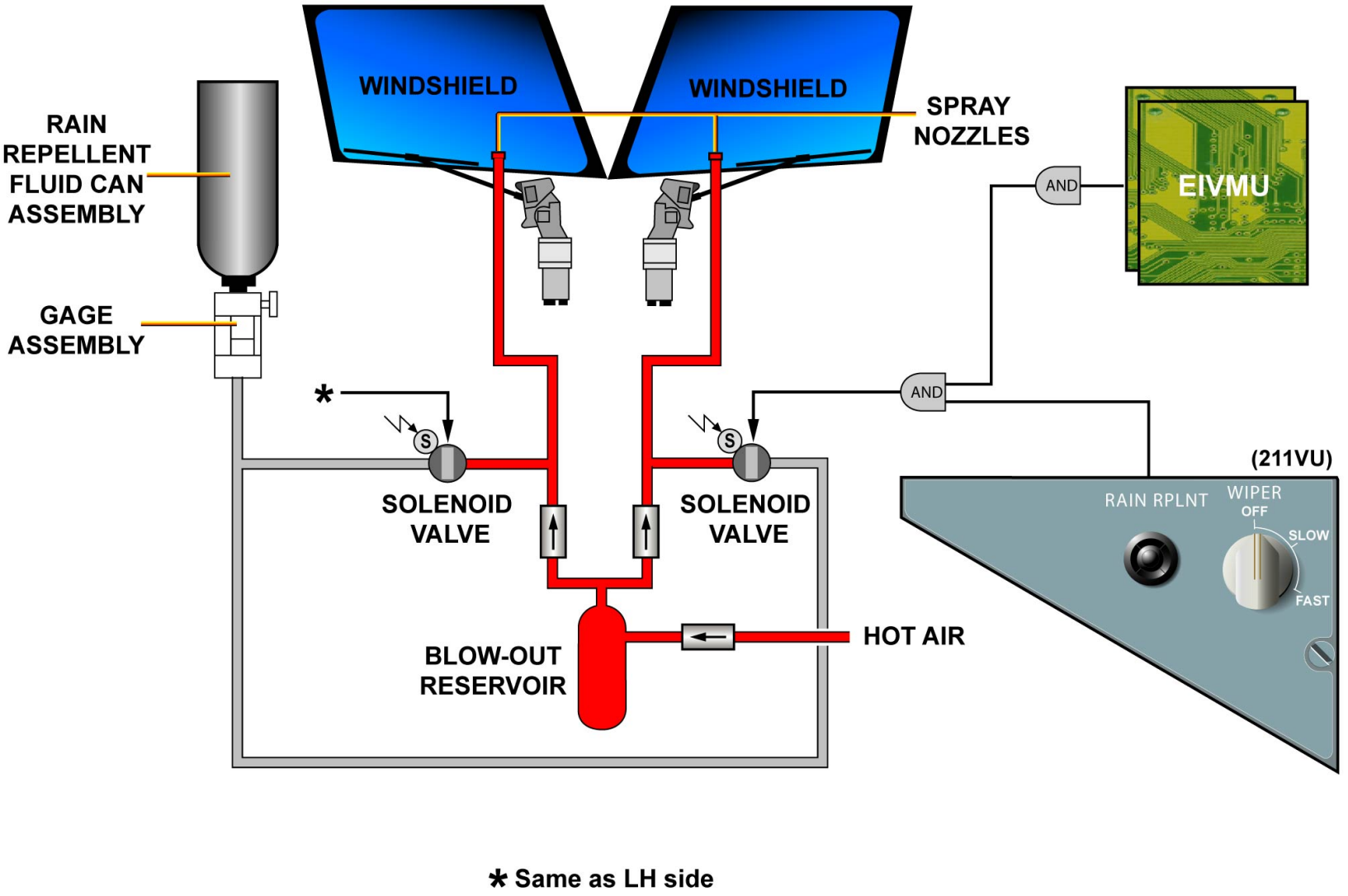
G9409341 - GAUT0T0 - FM30D8000000001

WINDSHIELD A.ICE/DEFOGGING & RAIN PROT D/O (3)

RAIN REPELLENT SYSTEM

The rain repellent system is composed of a pressurized rain repellent can assembly for storage, a gage assembly for pressure indicating, time controlled solenoid valves, 2 spray nozzles and a blow-out reservoir, which enables the spray nozzles to be purged with hot air.
When the rain repellent P/B is pressed in, the solenoid valve opens for a short time. This causes a measured quantity of rain repellent liquid to be sprayed onto the related windshield. On ground, the rain repellent system is inhibited on the ground when engines are shut down.

G9409341 - GAUT0T0 - FM30D8000000001



RAIN REPELLENT SYSTEM

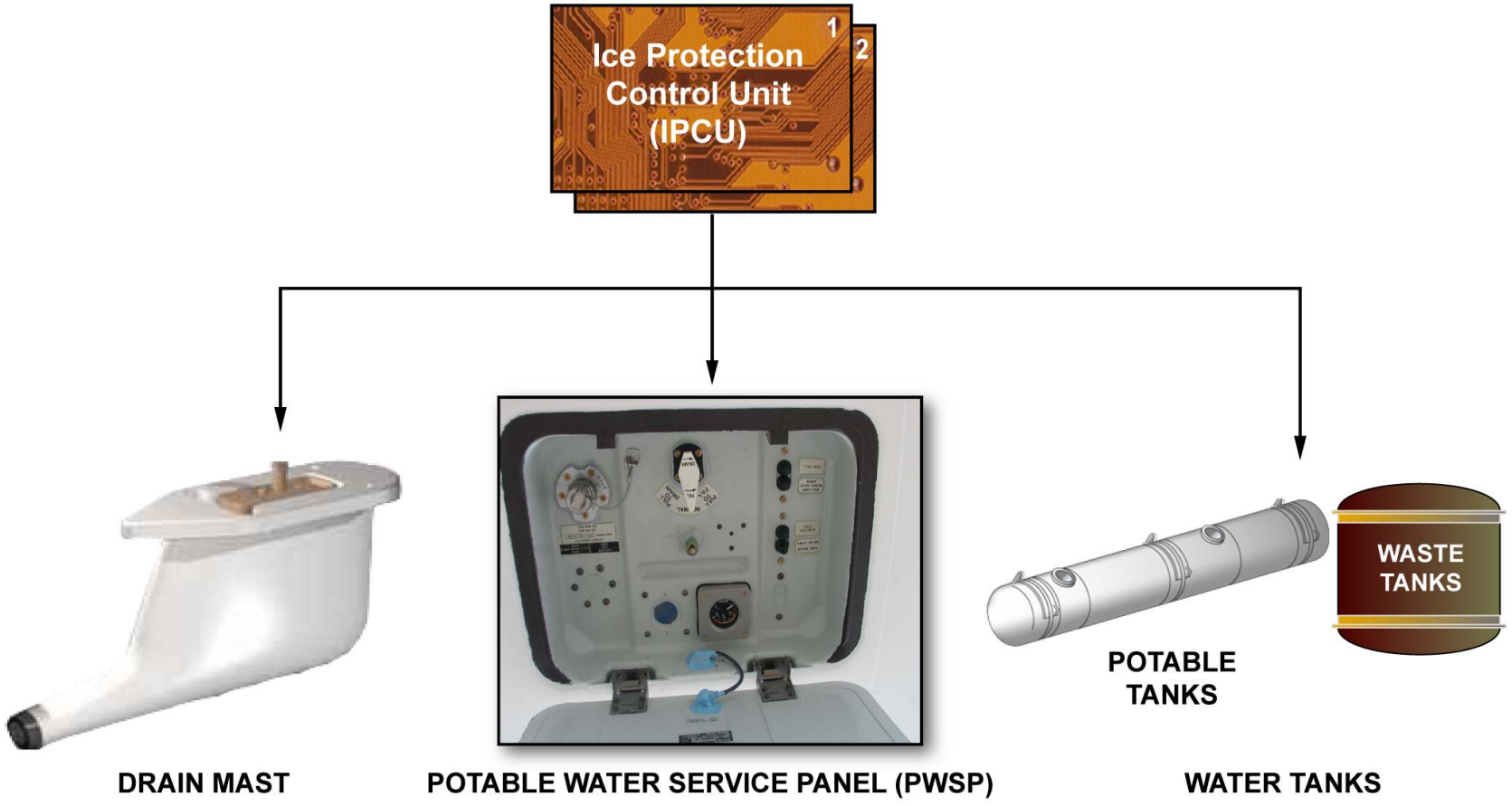
G9409341 - GAUT0T0 - FM30D8000000001

POTABLE & WASTE WATER ICE PROTECTION D/O (3)

GENERAL

An automatic electrical water ice protection system is installed to prevent ice formation in the water pipes and drain masts in flight or on ground at given freezing temperatures. Two Ice Protection Control Units (IPCUs) control and monitor this system.

G9409341 - GAUT0T0 - FM30D9000000001


Ice Protection Control Unit (IPCU)
1
2
WASTE TANKS
POTABLE TANKS
DRAIN MAST
POTABLE WATER SERVICE PANEL (PWSP)
WATER TANKS
The Potable Water Service Panel (PWSP) is different if 3 tanks are installed.

GENERAL

POTABLE & WASTE WATER ICE PROTECTION D/O (3)

ELECTRICAL HEATING ELEMENTS

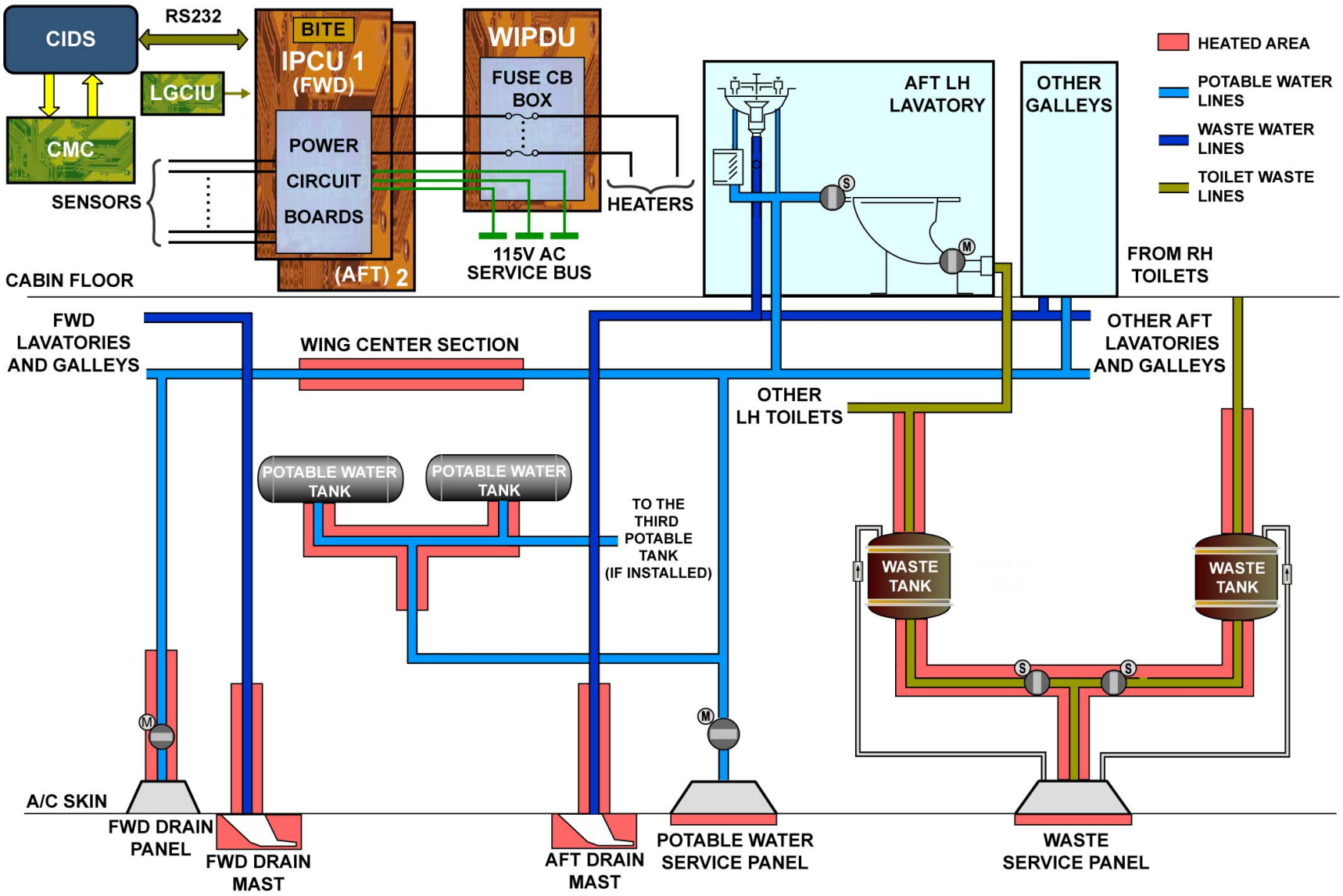
Electrical heating elements equipped with temperature sensors, are fitted on the following components:
- the water lines,
- the drain masts,
- the Potable Water Service Panel (PWSP) and the valve,
- the waste tank drain tubes and valves,
- the toilet waste lines.

NOTE: A third potable water tank can be installed optionally.

CONTROL

Electrical heating elements are controlled and monitored by two IPCUs. The IPCUs turn the electrical heating on or off depending on information from temperature sensors. Programmable temperature thresholds are stored in the IPCUs. The Water Ice Protection Control Units (WIPDU) are installed on a bracket in the WIP fuse CB box. The WIPDU permit to adjust the individual current threshold depending on the number, length and type of heaters per heating circuit. The Landing Gear Control and Interface Unit (LGCIU) sends a ground/flight signal to the WIPDU to enable heating of the heating circuits, on ground and/or in flight.
A BITE test is performed every 5 minutes by the IPCUs, which transmit the system status to the Cabin Intercommunication Data System (CIDS) and to the Centralized Maintenance System (CMS).

G9409341 - GAUT0T0 - FM30D9000000001



ELECTRICAL HEATING ELEMENTS & CONTROL

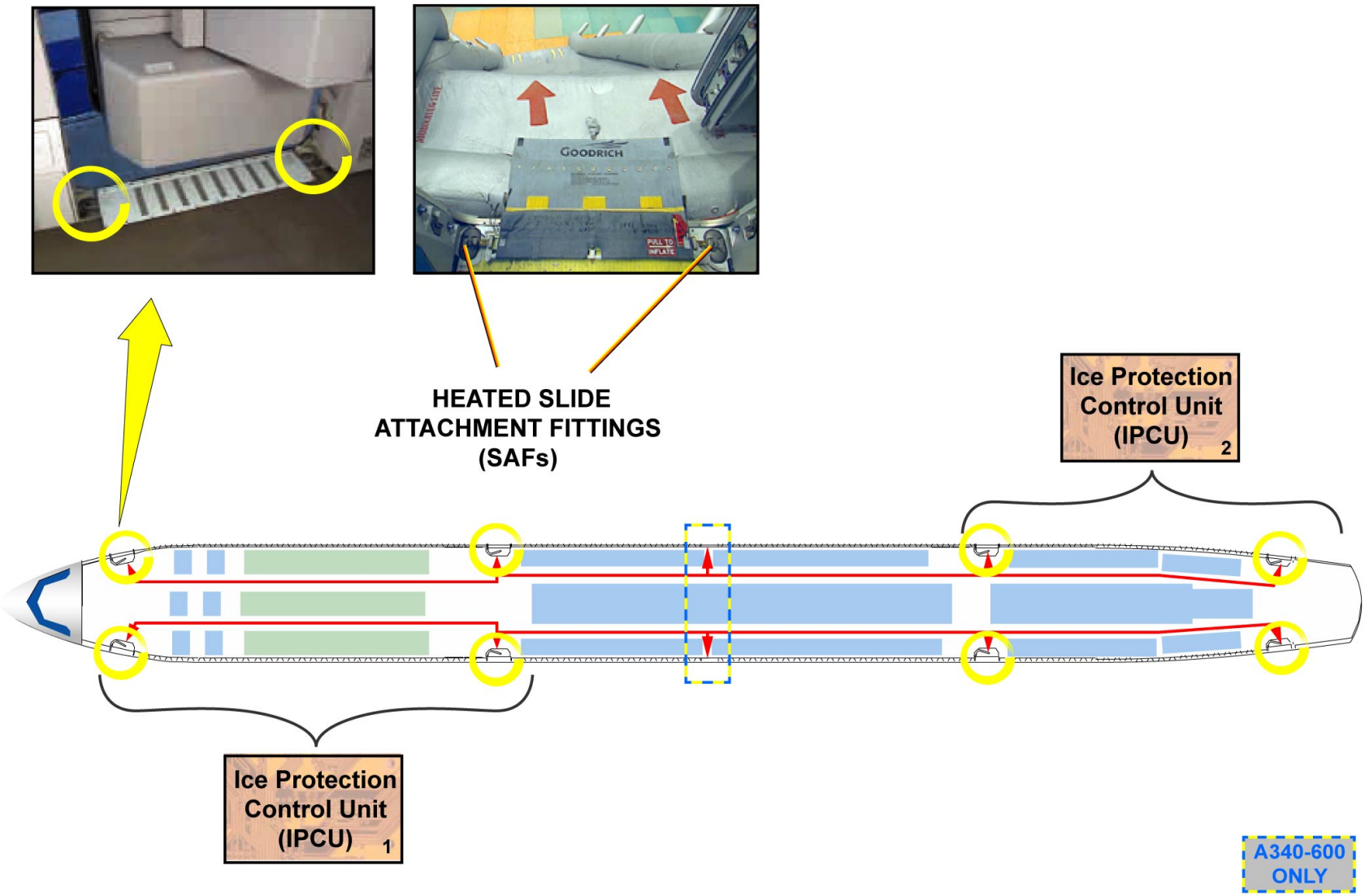
G9409341 - GAUT0T0 - FM30D9000000001

ESCAPE SLIDE LOCKING MECHANISM ICE PROTECTION D/O (3)

GENERAL

To make sure that the escape slide locking mechanism can be disarmed at the opening of the door, the system prevents ice formation of condensation water in the Slide Attachment Fittings (SAFs). Each passenger door has two heated SAFs. The overwing-emergency exits (only on the A340-600) have no heated SAFs.
The SAFs lock the escape slide girt-bar to the doorframe structure, when the door-emergency control handle is in the ARMED position. They are installed by the doors sill area of each passenger/crew door. Two Ice Protection Control Units (IPCU 1 and IPCU 2) control and monitor the 16 SAFs. The fwd IPCU controls and monitors the SAFHs of the fwd and middle1 passenger/crew doors LH/RH. The aft IPCU controls and monitors the SAFHs of the middle2 and aft passenger/crew doors LH/RH.

G9409341 - GAUT0T0 - FM30D6000000002


GOODRICH
HEATED SLIDE ATTACHMENT FITTINGS (SAFs)
Ice Protection Control Unit (IPCU) 2
Ice Protection Control Unit (IPCU) 1
A340-600 ONLY

GENERAL

G9409341 - GAUT0T0 - FM30D6000000002

ESCAPE SLIDE LOCKING MECHANISM ICE PROTECTION D/O (3)

DESCRIPTION

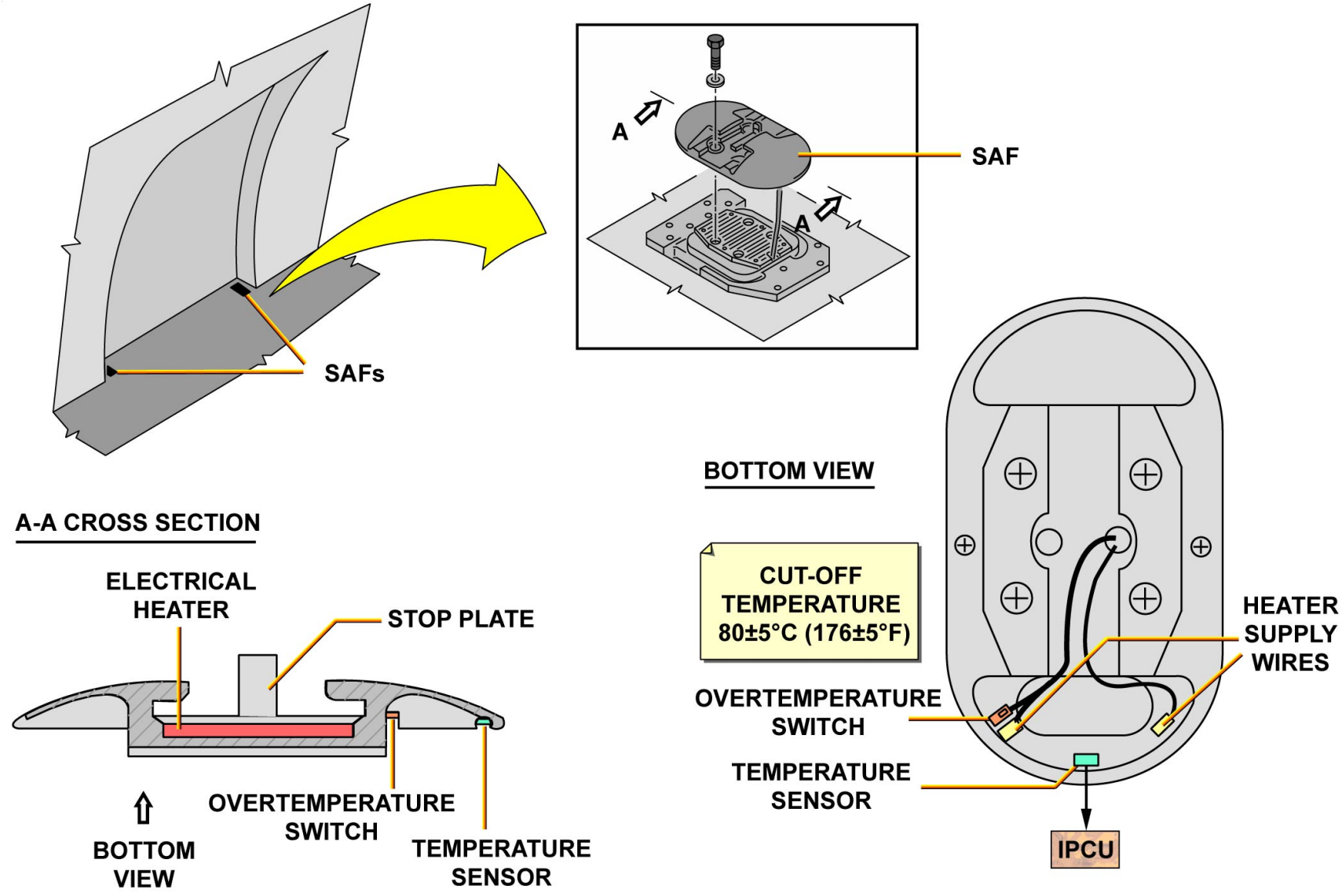
The escape slide locking mechanism with the ice protection system is composed of 16 SAFs and 2 IPCUs.

SLIDE ATTACHMENT FITTINGS

One SAF has:
- one electrical heater,
- one temperature sensor,
- one overtemperature switch.

The electrical heater is installed between the bottom of the SAF and the SAF stop plate. The temperature sensor and the overtemperature switch are installed on the lower side of the SAF:
- the temperature sensor is connected to one IPCU. It continuously measures the temperature of the SAF,
- the overtemperature switch protects the heater element in case of a malfunction of the temperature sensor. The cut-off temperature is 80±5°C (176±5°F).

G9409341 - GAUT0T0 - FM30D6000000002



DESCRIPTION - SLIDE ATTACHMENT FITTINGS

G9409341 - GAUT0T0 - FM30D6000000002

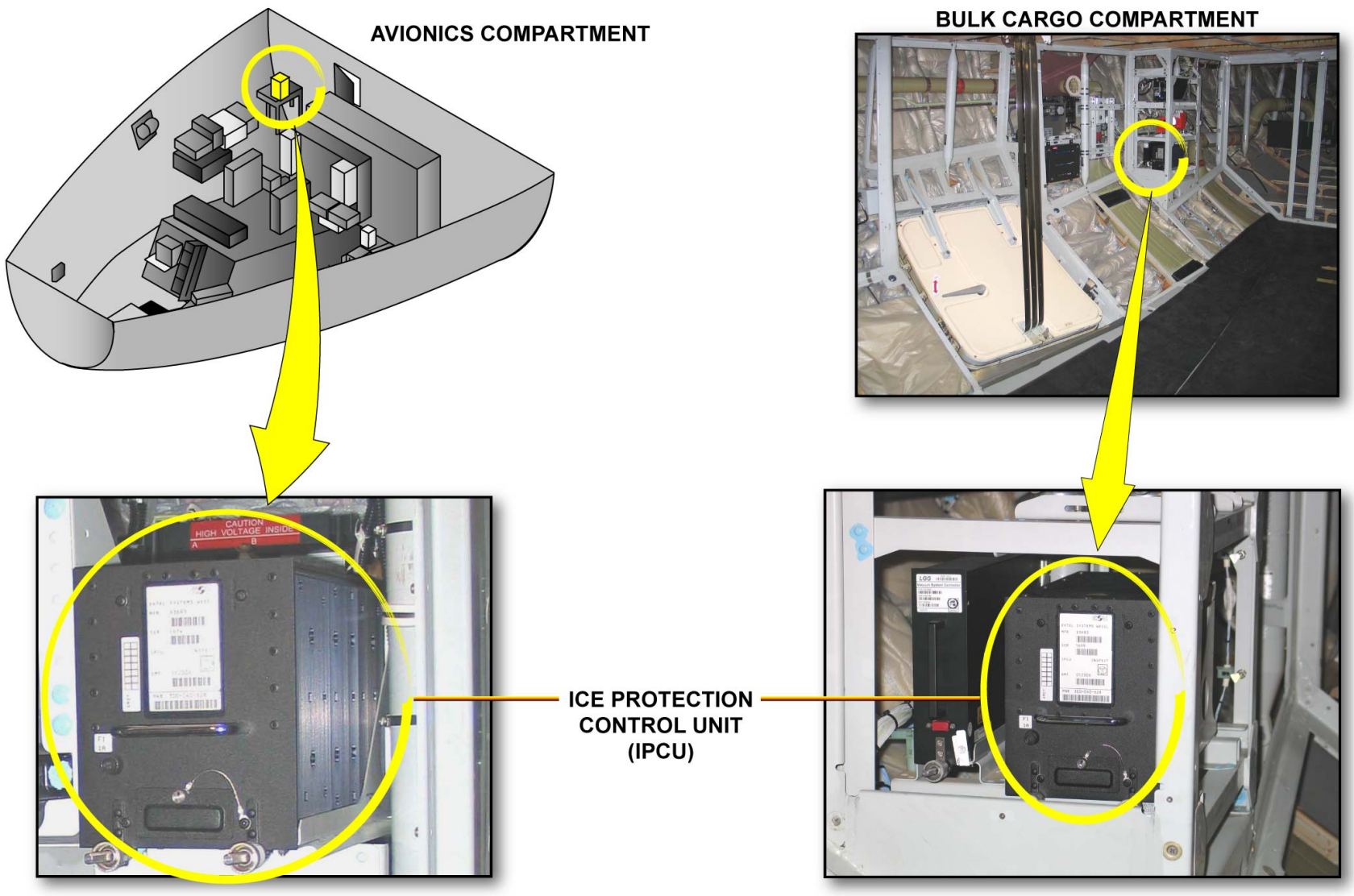
ESCAPE SLIDE LOCKING MECHANISM ICE PROTECTION D/O (3)

DESCRIPTION (continued)

IPCU LOCATION

Two IPCUs are installed:
- one on the right hand side of the Avionics Compartment,
- and one on the right hand side of the Aft Cargo Compartment.

G9409341 - GAUT0T0 - FM30D6000000002



DESCRIPTION - IPCU LOCATION

ESCAPE SLIDE LOCKING MECHANISM ICE PROTECTION D/O (3)

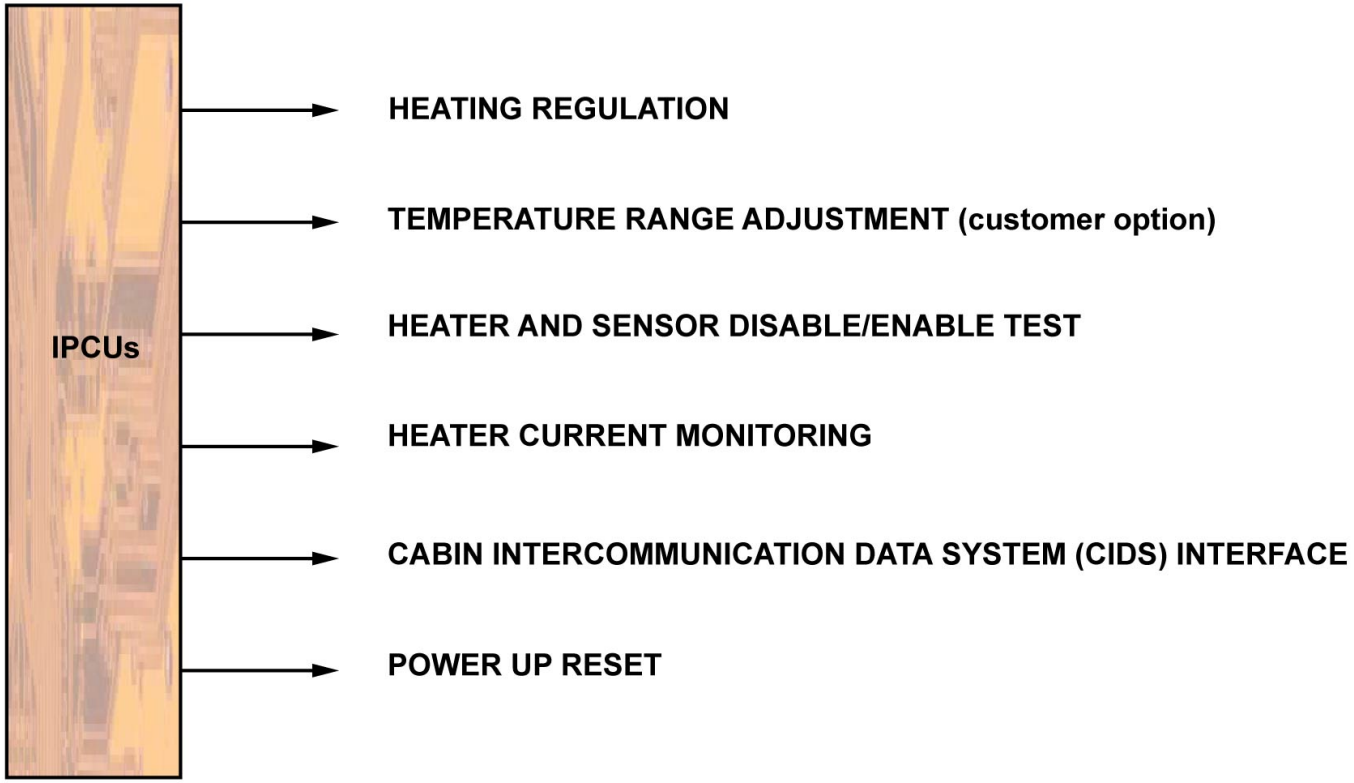
DESCRIPTION (continued)

IPCU FUNCTIONS

The primary functions of the IPCUs are:
- heating regulation,
- temperature range adjustment (customer option),
- heater and sensor disable/enable test,
- heater current monitoring,
- Cabin Intercommunication Data System (CIDS) interface,
- power-up reset.

G9409341 - GAUT0T0 - FM30D6000000002

IPCU FUNCTIONS



DESCRIPTION - IPCU FUNCTIONS

ESCAPE SLIDE LOCKING MECHANISM ICE PROTECTION D/O (3)

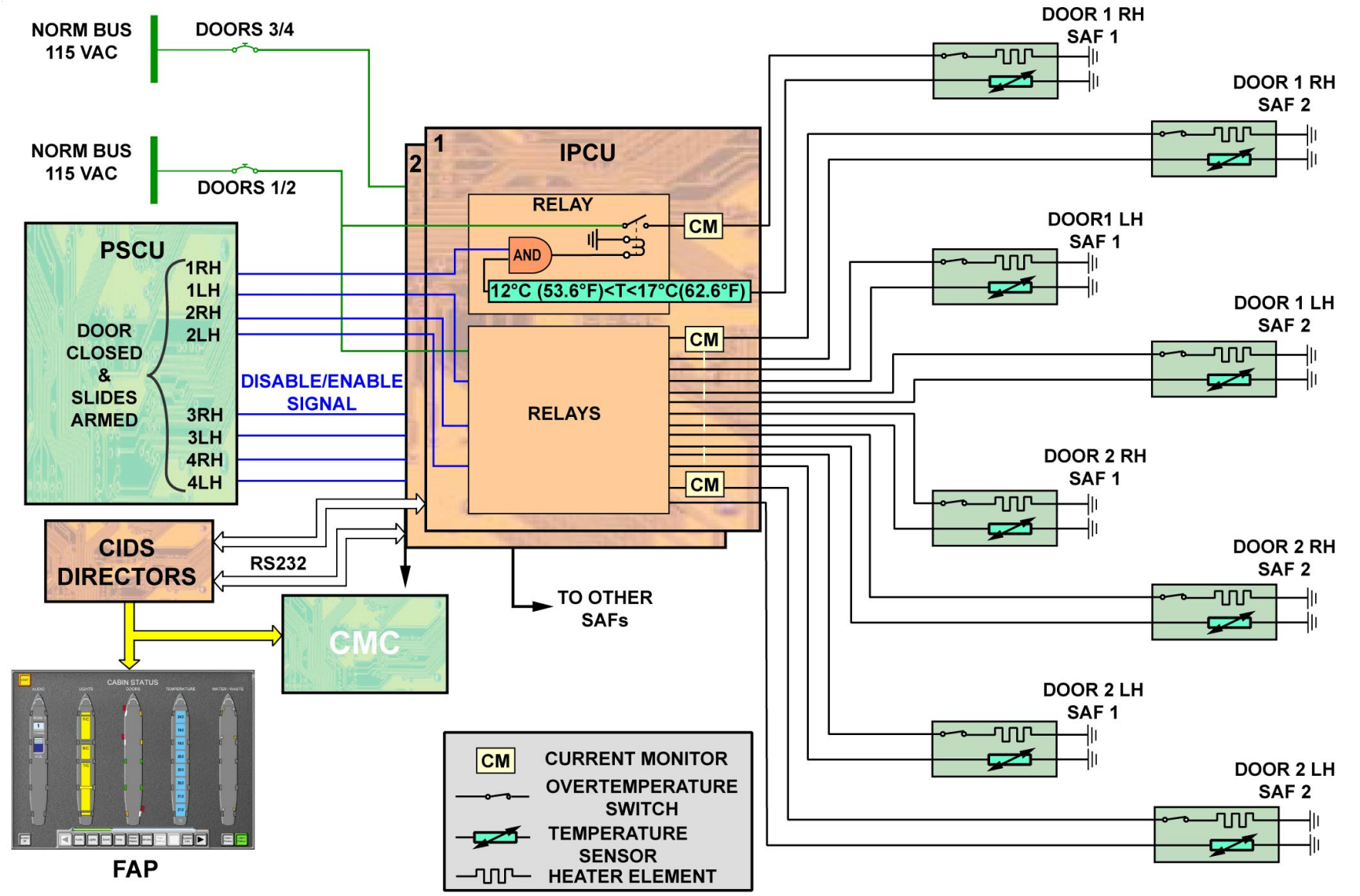
NORMAL OPERATION

Each IPCU receives a 115 VAC power supply used for operation and heater supply. The Escape Slide Locking Mechanism with the Ice Protection System has an interface with the Door Proximity Switch Control Unit (PSCU) for door and slide arming signal information.
The IPCU controls each door heating SAF by closing the associated power relay when the following conditions are met:
- the associated door is closed and the associated emergency control handle is in the "armed" position (enable signal from PSCU),
- the SAF temperature sensor reads less than 12°C (53.6°F).
When the temperature is higher than 17°C (62.6°F), the IPCU switches the heating off.

MONITORING

Each IPCU can be tested either automatically every five minutes or manually from the MCDU through the CIDS GROUND SCANNING page. Each heater element electrical current is monitored by its associated IPCU for status fault detection. If a fault is detected, a fault message is displayed on the FAP, and a class 3 fault message is triggered identifying the faulty SAF.

G9409341 - GAUT0T0 - FM30D6000000002



NORMAL OPERATION - MONITORING

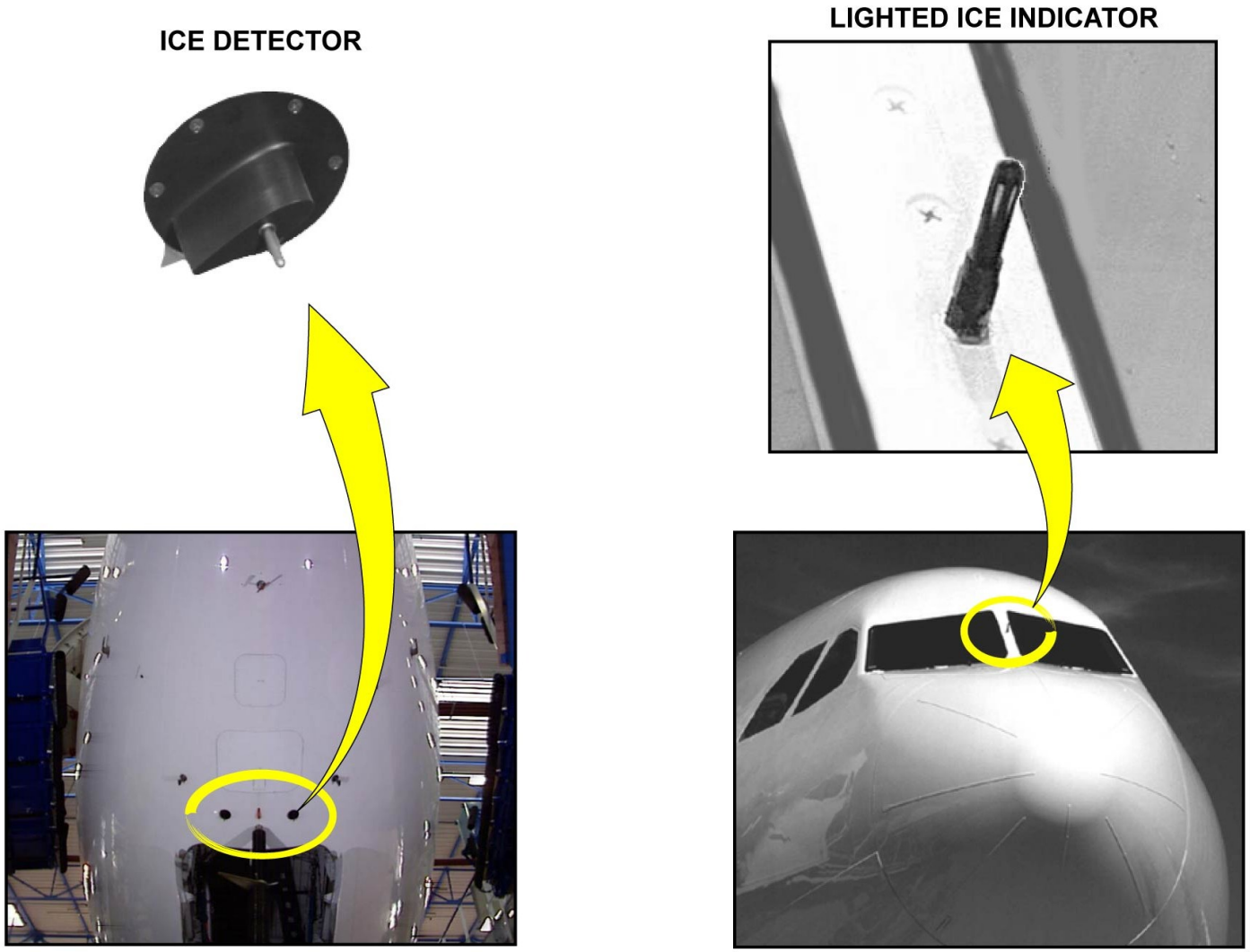
G9409341 - GAUT0T0 - FM30D6000000002

ICE DETECTION D/O (3)

GENERAL

The purpose of the ice detection system is to provide better detection of icing conditions and fuel saving by cutting off the anti ice system when it is no longer necessary. Two ice detectors are installed on the fuselage in front of the nose gear. A visual detection system informs the crew that icing conditions are encountered, by accretion of ice on a visual lighted indicator.

G9409341 - GAUT0T0 - FM30DA000000001



GENERAL

ICE DETECTION D/O (3)

OPERATION

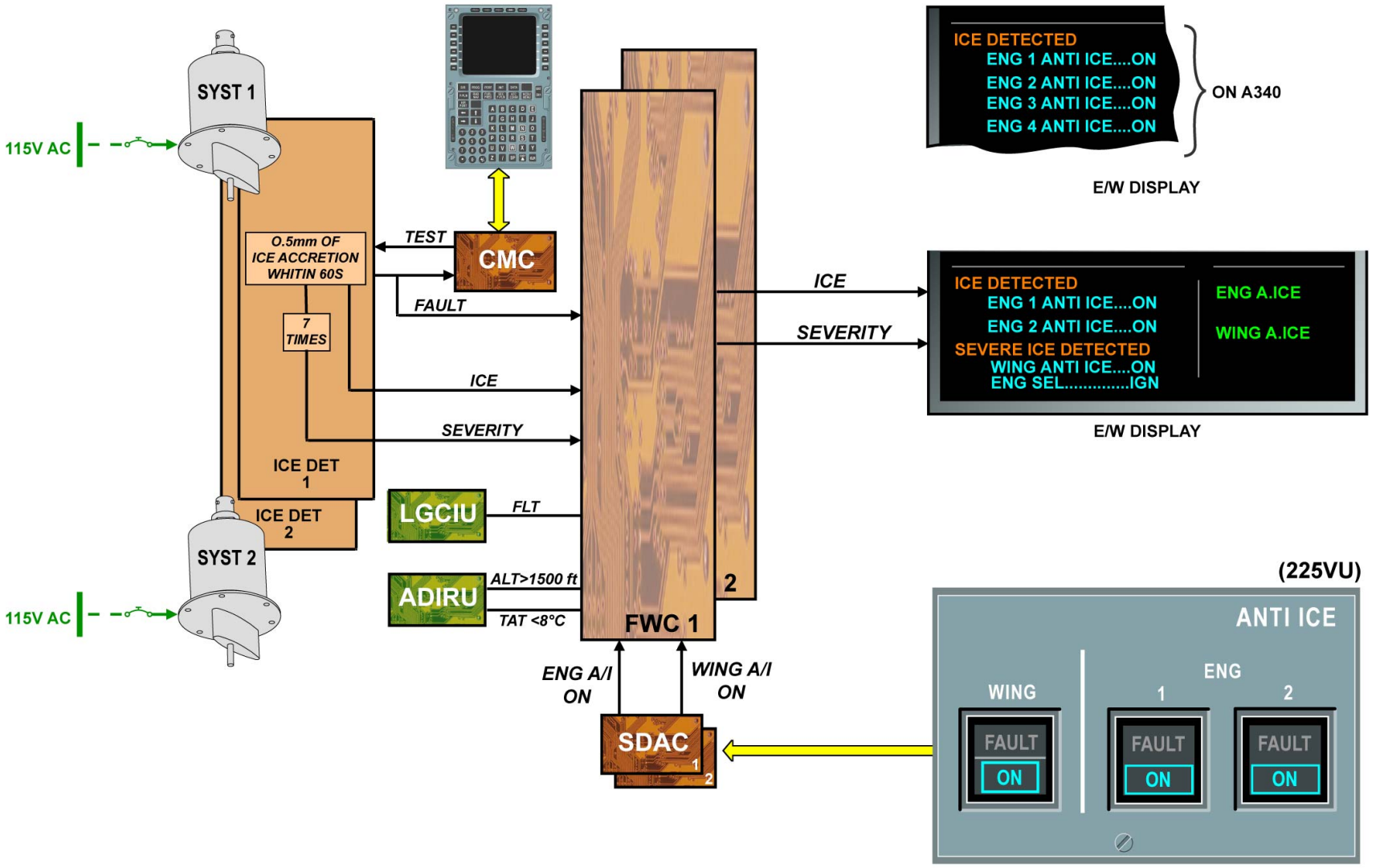
The sensing probe of the ice detector is driven to vibrate at its resonant frequency of 40 KHz. Then, the weight of the accreted ice causes the frequency to decrease.
The frequency drop caused by 0.508 plus or minus 0.127 mm of ice is considered as the detection trip point. When the trip point is reached, the probe is de-iced by means of internal heaters to prepare for subsequent detections.
The ice detection system is directly connected to the Flight Warning Computer (FWC) to send warning messages to the crew on the EWD.
The ice detection system operates at electrical power-up. It sends warnings in flight above 1500 ft and when the Total Air Temperature (TAT) is below 8 degrees Celsius. The system is inhibited on ground.

INDICATION AND MONITORING

There are two levels of indication: ICE DETECTED corresponding to an elementary detection and SEVERE ICE DETECTED corresponding to 7 elementary detections. These two levels are displayed on the EWD.
The ENG A. ICE and WING A. ICE messages are displayed in green on the MEMO item of the EWD when the corresponding valves are open.
These indications are pulsing when:
- the engine or wing anti ice has been selected on
- no icing conditions have been detected by the ice detectors for 190 seconds
- one ice detector FAULT signal at least, is correct.

Each ice detector is equipped with a BITE function for continuous monitoring. A fault signal is displayed when the two ice detectors are faulty. Fault signals are sent to the System Data Acquisition Concentrator (SDAC) and to the Central Maintenance Computer (CMC).

G9409341 - GAUT0T0 - FM30DA000000001



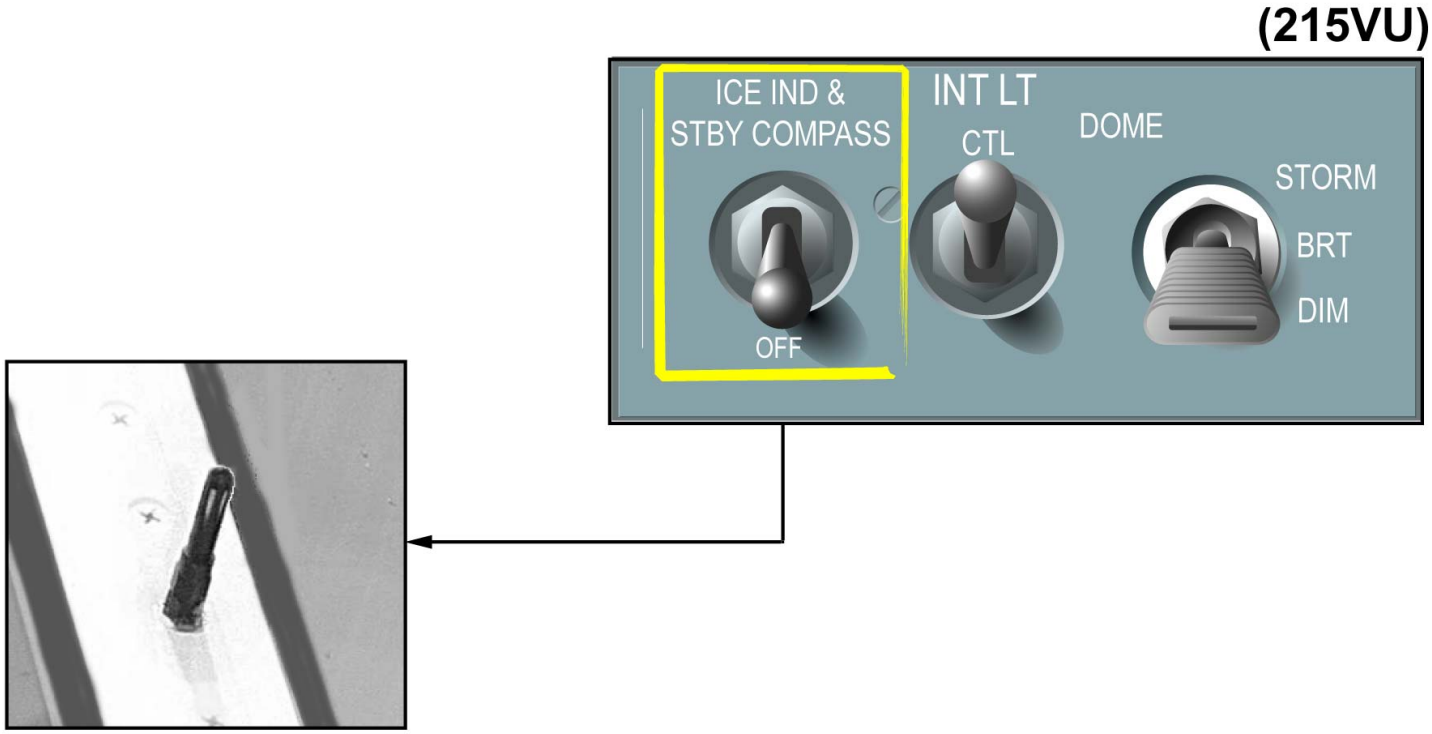
OPERATION & INDICATION AND MONITORING

ICE DETECTION D/O (3)

VISUAL LIGHT INDICATOR

The ICE IND AND STBY COMPASS switch controls the illumination of the lighted icing indicator.

G9409341 - GAUT0T0 - FM30DA000000001



VISUAL LIGHT INDICATOR

ICE & RAIN PROTECTION SYSTEM BASE MAINTENANCE (3)

INTRODUCTION

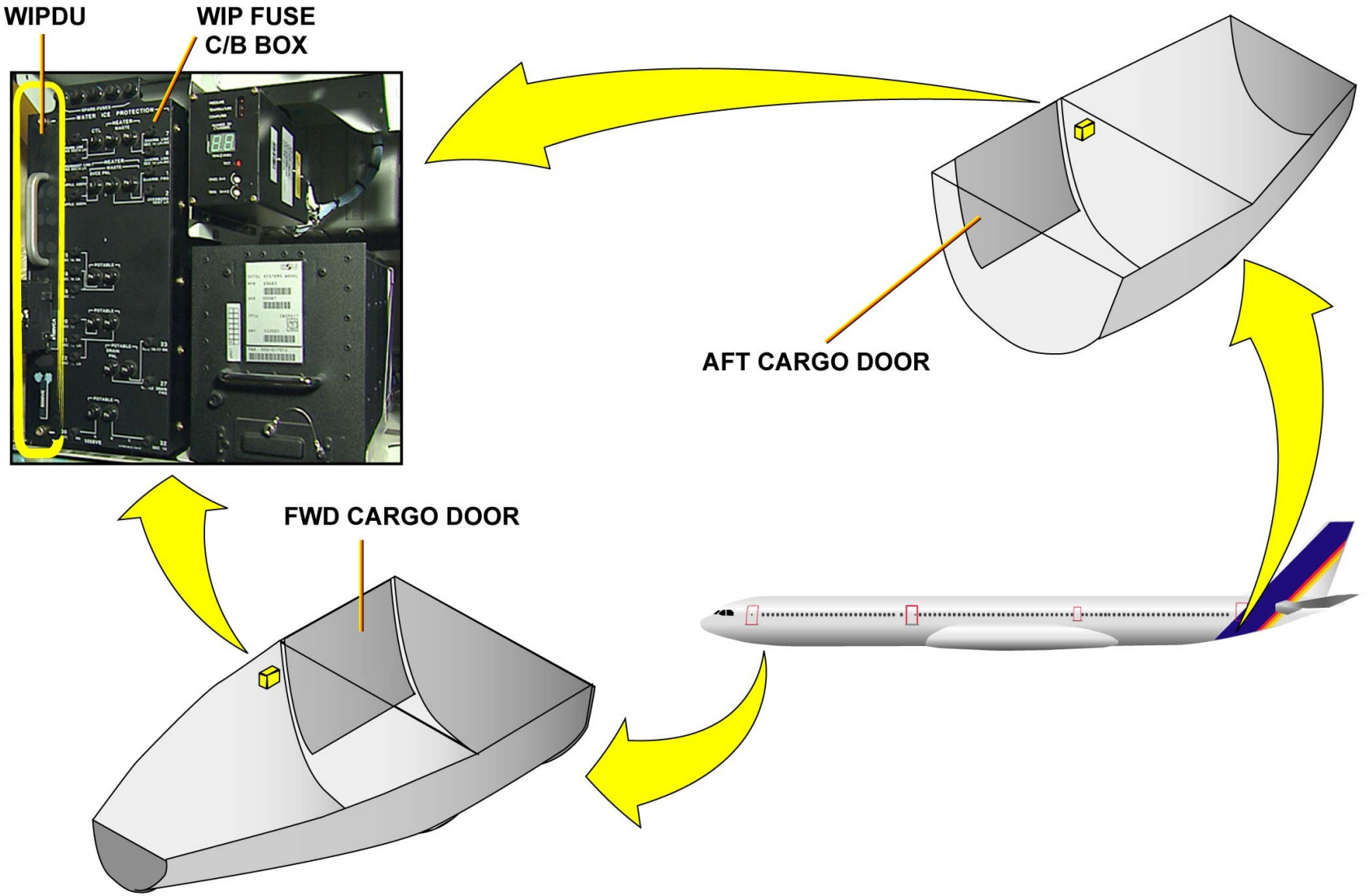
One base servicing procedure is described in this module. This task concerns the adjustment of the Water Ice Protection Data Unit (WIPDU) coding switches and "enable micro switches" following the components replacement.
This task is accomplished to set the WIDPU in function of the A/C heating circuits configuration.

ADJUSTMENT OF THE WIPDU CODING SWITCHES AND "ENABLE MICRO SWITCHES"

There are two WIPDUs by A/C: one is located in the avionic bay, the other in the aft cargo compartment. As the AMM procedure is the same for the FWD WIPDU setting and the aft WIPDU setting, the FWD WIPDU procedure is chosen for example.
Do a visual inspection of the component interface and the adjacent area.
The WIPDU is a removable Printed Circuit Board (PCB) fitted next to the Water Ice Protection fuse C/B box (WIP fuse C/B box).
Pull the WIPDU after screws removal.
Set the coding switches and "enable micro switches" according to the A/C heating circuits configuration and heating requirements.

NOTE: The displayed values are chosen for example. Each position of the coding switch corresponds to an intensity value.

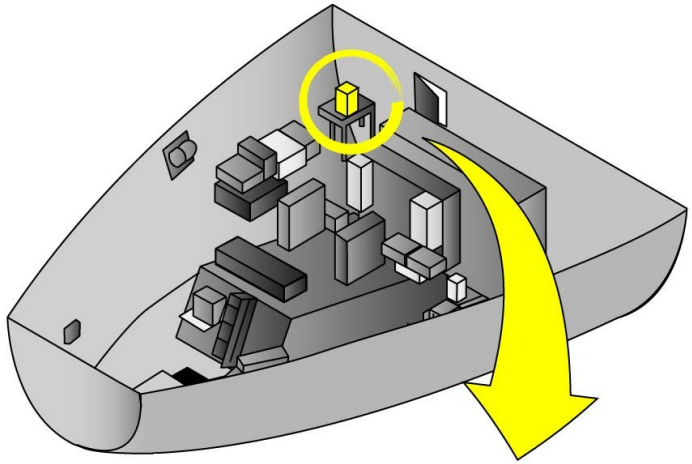
Install the WIPDU next to the WIP fuse C/B box and make sure the area is clean.

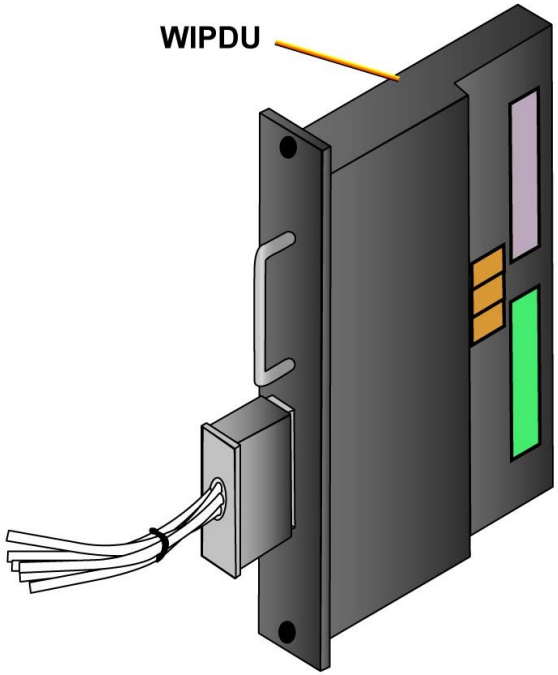


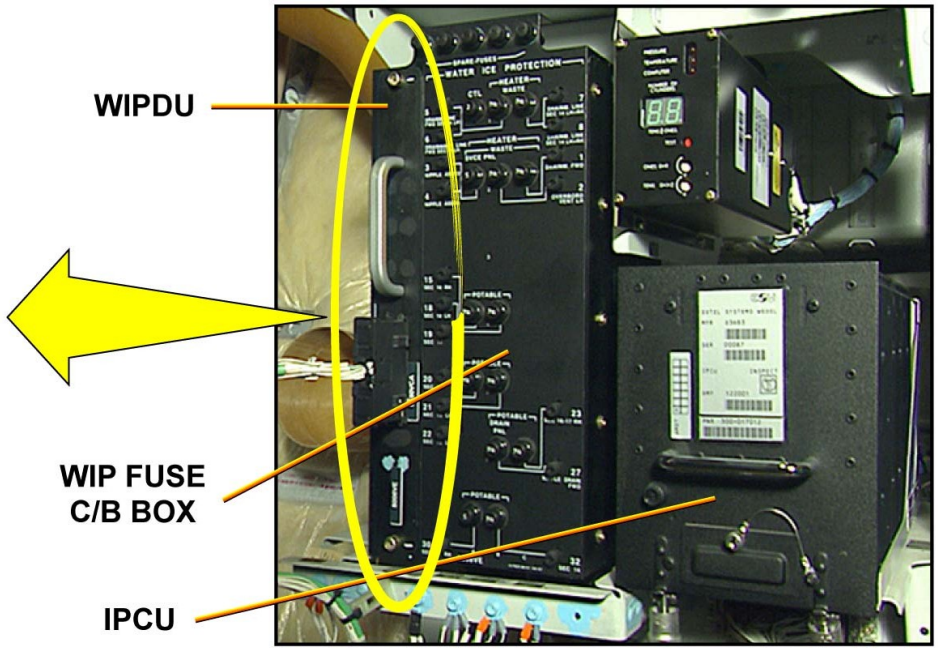
INTRODUCTION & ADJUSTMENT OF THE WIPDU CODING SWITCHES AND "ENABLE MICRO SWITCHES"

Adjustment of the WIPDU coding switches and "enable micro switches":

...
Job set-up
...
Do a visual inspection.
...
Procedure
...
Adjustment of the WIPDU.
...
Close-up
...







INTRODUCTION & ADJUSTMENT OF THE WIPDU CODING SWITCHES AND "ENABLE MICRO SWITCHES"

Adjustment of the WIPDU coding switches and "enable micro switches":

...

Job set-up

...

Do a visual inspection.

...

Procedure

...

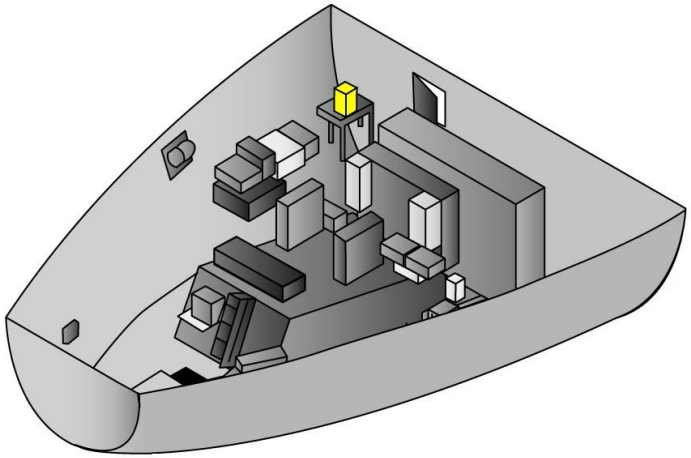
Adjustment of the WIPDU:

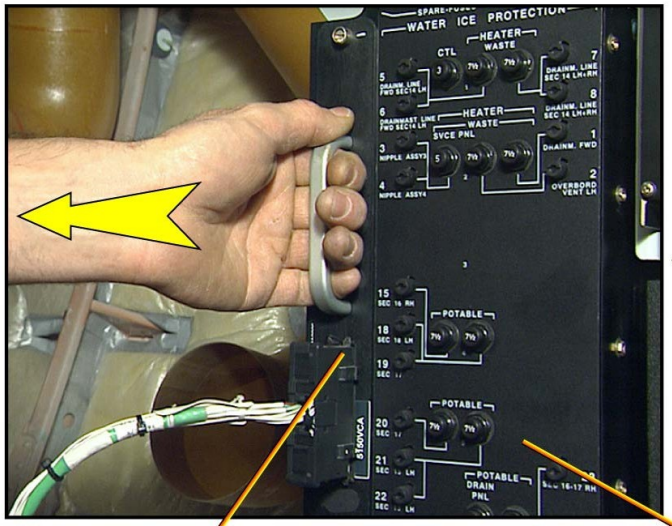
- Pull the WIPDU drawer.
- Adjust the coding switches and "enable micro switches".

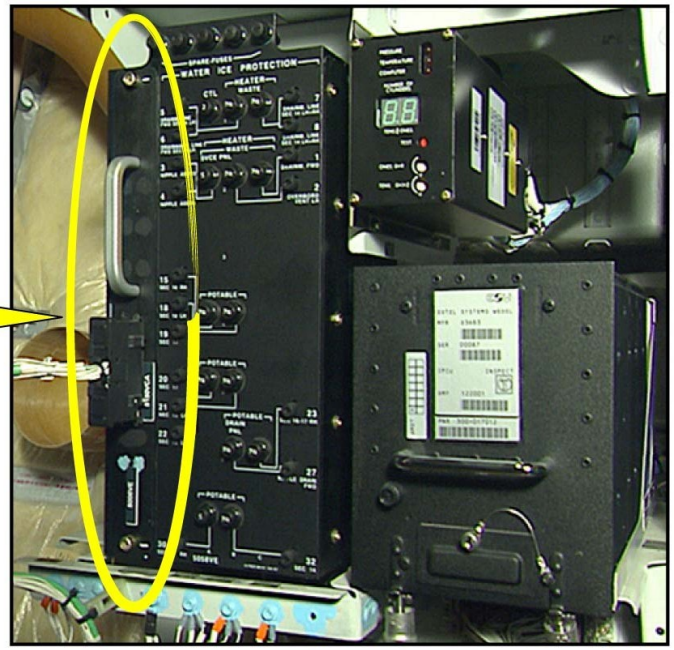
...

Close-up

...







INTRODUCTION & ADJUSTMENT OF THE WIPDU CODING SWITCHES AND "ENABLE MICRO SWITCHES"

G9409341 - GAUT0T0 - FM30Y2BASEMCE02

Adjustment of the WIPDU coding switches and "enable micro switches":

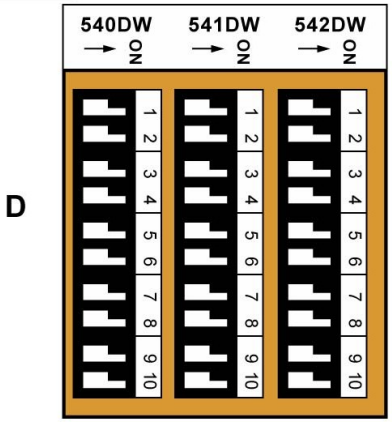
...
Job set-up
...

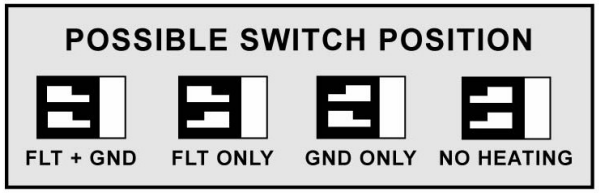
✓ **Do a visual inspection.**

...
Procedure
...

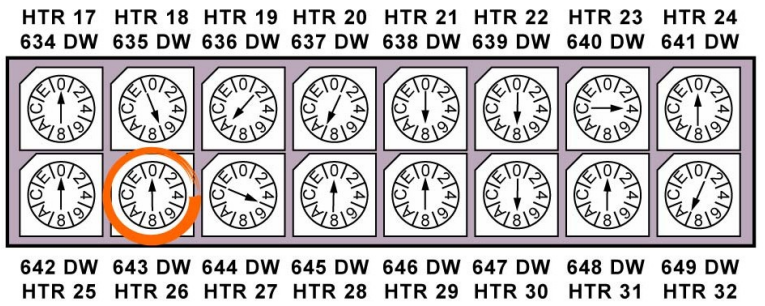
⇨ **Adjustment of the WIPDU:**
✓ - Pull the WIPDU drawer.
⇨ - Adjust the coding switches and "enable micro switches".

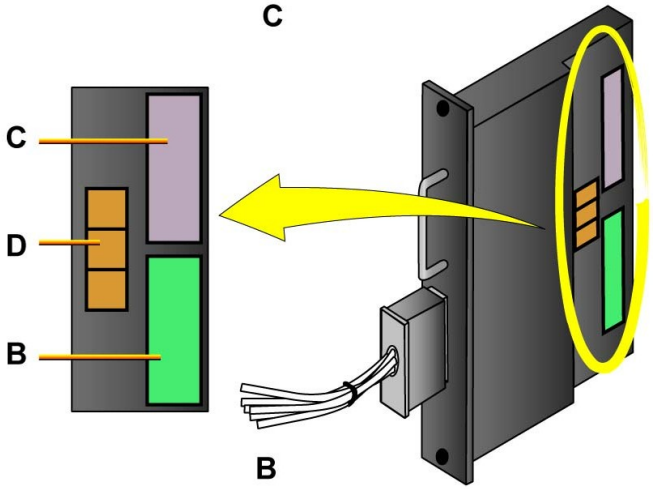
...
Close-up
...

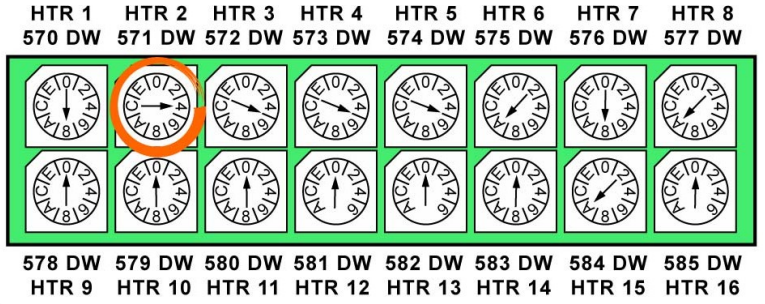




SWITCH SETTINGS	
0	NO HEATER
1	100 mA
2	200 mA
3	300 mA
4	400 mA
5	500 mA
6	600 mA
7	700 mA
8	800 mA
9	900 mA
A	1000 mA
B	1200 mA
C	1400 mA
D	1600 mA
E	1800 mA
F	2000 mA






HTR 1 570 DW
HTR 2 571 DW
HTR 3 572 DW
HTR 4 573 DW
HTR 5 574 DW
HTR 6 575 DW
HTR 7 576 DW
HTR 8 577 DW
578 DW HTR 9
579 DW HTR 10
580 DW HTR 11
581 DW HTR 12
582 DW HTR 13
583 DW HTR 14
584 DW HTR 15
585 DW HTR 16

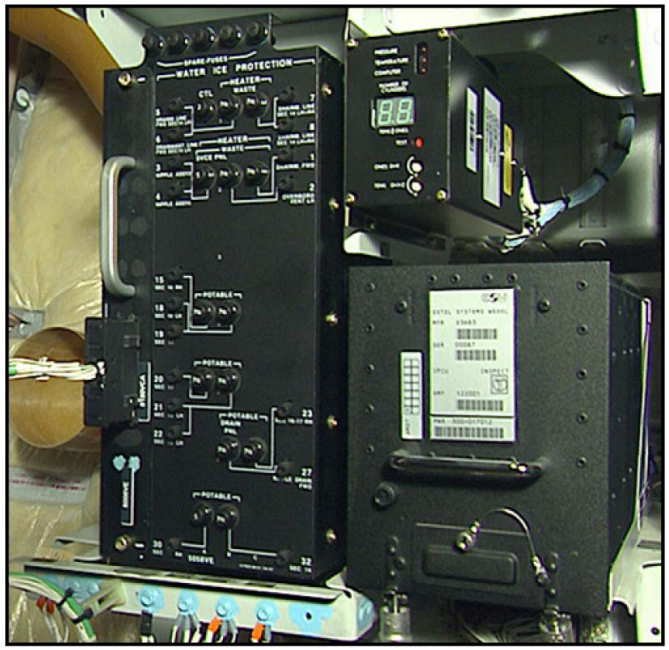
INTRODUCTION & ADJUSTMENT OF THE WIPDU CODING SWITCHES AND "ENABLE MICRO SWITCHES"

G9409341 - GAUT0T0 - FM30Y2BASEMCE02

Adjustment of the WIPDU coding switches and "enable micro switches":

- ...
- ✓ Job set-up
- ...
- ✓ Do a visual inspection.
- ...
- ✓ Procedure
- ...
- ✓ Adjustment of the WIPDU.
- ...
- ✓ Close-up
- ...

TASK COMPLETED



INTRODUCTION & ADJUSTMENT OF THE WIPDU CODING SWITCHES AND "ENABLE MICRO SWITCHES"

AIRBUS

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